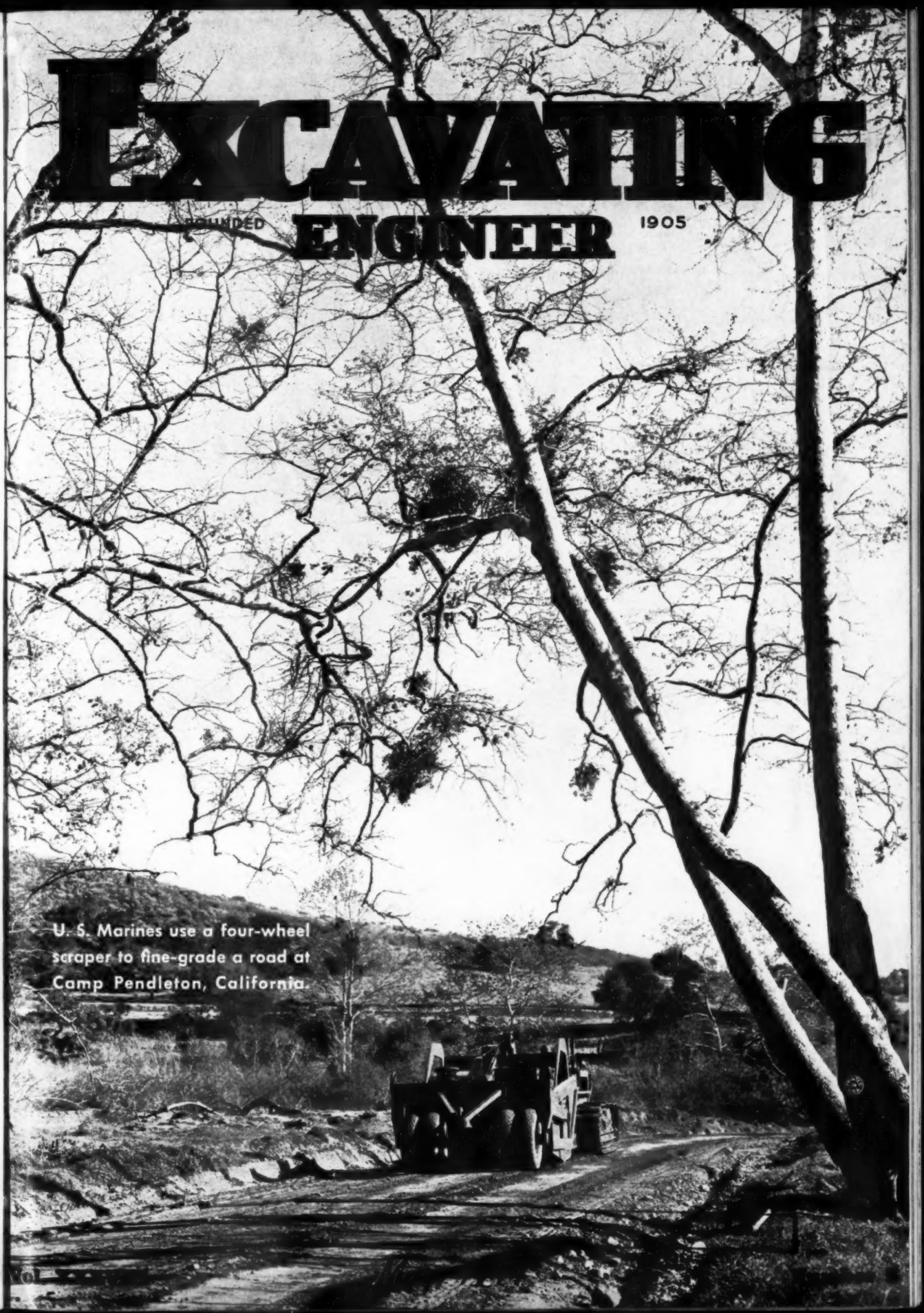
EXCAVATING ENGINEER

FOUNDED 1905



U. S. Marines use a four-wheel scraper to fine-grade a road at Camp Pendleton, California.

Adjust Yourself to Victory

To keep your excavator operating efficiently over the longest possible period, adjustments must be made promptly. A dragging clutch not only wears out its band too soon, but it steals power, and may result in unnecessary stresses throughout the parts functioning in the operating cycle.

Improper adjustments may not show up at once in output figures because a skillful operator can often compensate for them. In the long run, however, repair costs and delays resulting from poor adjustments will cut output and increase costs.

The time required to keep all parts of your excavator adjusted correctly will be more than repaid in decreased power consumption and lower maintenance costs.

Follow your manufacturer's recommendations for care and maintenance carefully and you will keep your excavator going at top speed for Uncle Sam.

ARMY E NAVY

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

The Original and Outstanding
500 cubic-foot Portable Compressor

And here are some other things you should know about the machine that revolutionized portable compressor practice in 1939:

1 It's the only 500-cfm portable available with a gasoline engine as well as an oil engine. (See ★ below).

2 Weighs only 10,600 pounds... the lightest 500-cfm machine available.

3 Big enough to run two powerful FM-2 wagon drills.

4 Small enough and tough enough to go trail-blazing over mountains and through swamps.

5 Drill-More multi-speed regulator makes the machine even more efficient at half load than at full load. When running only one wagon drill or lighter drills, no more fuel is required than if a smaller compressor were used.

6 Multi-speed regulation of portable-compressor capacity was originated by Ingersoll-Rand... introduced with the K-500. The average working speed of compressor and engine is lower... more efficient ...less wear.. longer life.

7 Spring mounting and automotive-type steering are standard.

8 Electric cranking with commercial 12-volt equipment is standard for oil as well as gasoline engine. Both engines are easily hand-cranked.

9 "Finger-tip" control of heavy-duty, easily maintained clutch.

10 All operating controls and gauges are centrally located.

11 Low, easily filled fuel tank.

12 Proven design, performance, stamina, and reliability... used all over the world.

★**13** Quickly convertible from operation on one fuel to another (oil, gasoline, or natural gas) by substituting external fuel accessories only.

★**14** Astonishingly low gasoline consumption presents a new consideration in the choice between oil and gasoline drive.

★**15** For oil, it's the well-known I-R Type H engine ...smooth running, easy to maintain, easy to start.

11 BROADWAY, **Ingersoll-Rand** NEW YORK 4, N. Y.

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COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • OIL AND GAS ENGINES

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A special transportation problem—solved by a special 100-ton Fruehauf Carryall.

MOST Trailers of the Carryall type—regardless of who builds them—are well-constructed.

But, for the kind of specialized hauling that men in your field do, there is another important factor to be considered—*has the Carryall you buy been designed for your particular job?*

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There is no need or inclination to adjust your requirements to our product—because it is just as easy, and far more satisfactory, to fit our product exactly to your requirements.

The Fruehauf you need may range in capacity from 10 to 100 tons . . . it may be either a semi or full Trailer type . . . single or double-drop frame . . . side or rear loading . . . may have four tires or twenty-four . . . with any one of many varieties of wheel and axle combinations . . . any width . . . any length . . . the applications to your special needs are endless.

Today, of course, few Carryalls are being built for civilian use. But today is not too soon to consult with our engineers on getting your *postwar* Carryall designed and through the blueprint stage, ready for the production go-ahead.

This costs you nothing extra—but it may save you weeks in the long run.

Here is a small Carryall—a cost-cutter in moving all types of light machinery.

World's Largest Builders of Truck-Trailers *Service in Principal Cities*

FRUEHAUF TRAILER COMPANY • DETROIT

EXCAVATING ENGINEER

FOUNDED 1905

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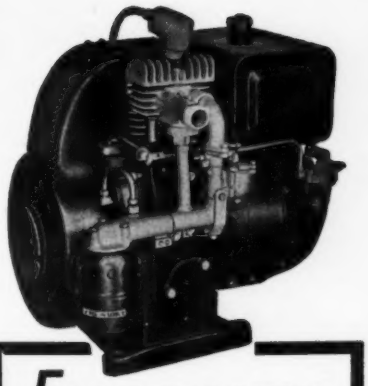

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Over 65 models, ranging in sizes from 350 to 35,000 watts. 50 to 800 cycles, 110 to 660 volts, A.C.—6 to 4000 volts, D.C.—Also dual A.C.-D.C. output types.

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1943 INDEX

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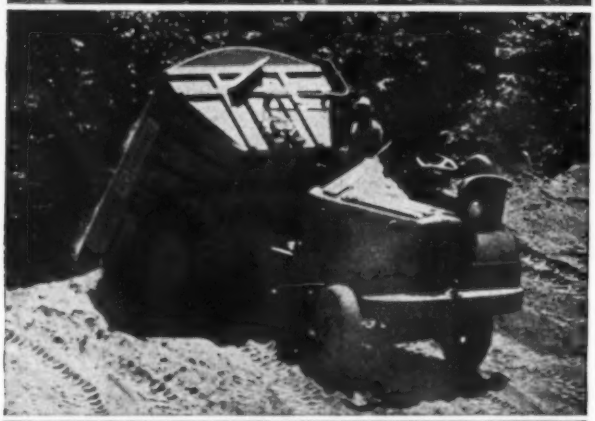

Rock or Dirt

DUMPED INSTANTANEOUSLY

Time saved on the fill is time saved for every trip . . . more trips per hour . . . more production per shift. The Koehring Dumptor dumps any type material *instantaneously*. Seconds saved over mechanical dumping method speeds up every hauling and dumping job. Rock or dirt is dumped equally fast and the load is dumped clean every time . . . ready for a full load every trip.

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ARMY E NAVY

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

WHY
Form-Set Purple Strand is still hard to get

No need to tell wire rope users that wire rope is hard to get.

You've been telling *us!*

But perhaps you'd like to know why, when consumers of some other products are looking toward easing of restrictions, wire rope is still tight. Here are some of the reasons:

The shipbuilding program, with its emphasis on landing craft, will continue to make heavy inroads on wire-rope production. And so, of course, will the year's stepped-up military and naval operations. Further, the country's 1944 oil program contemplates an increase of from 18,000 to 24,000 wells — and for wells so much deeper than ever before that oil-country demands for wire rope will leap upward from 80 to 100%.

We therefore make this suggestion: Figure your wire rope needs (and place your orders) as far in advance as possible. This offers the best assurance that the wire rope you are going to need through the year will be on hand when you need it.

And while you're thinking about wire rope, think of Form-Set Purple Strand.

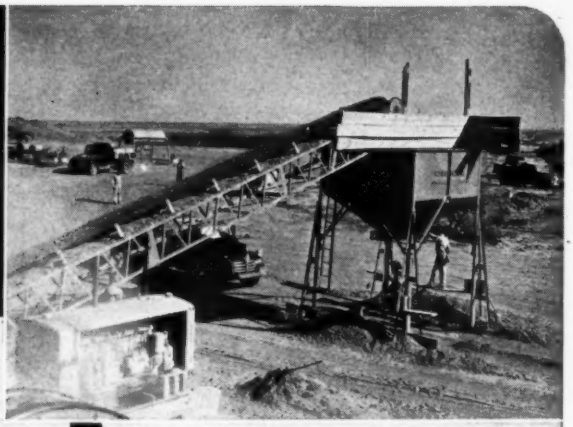
★ ★ BETHLEHEM STEEL ★ ★

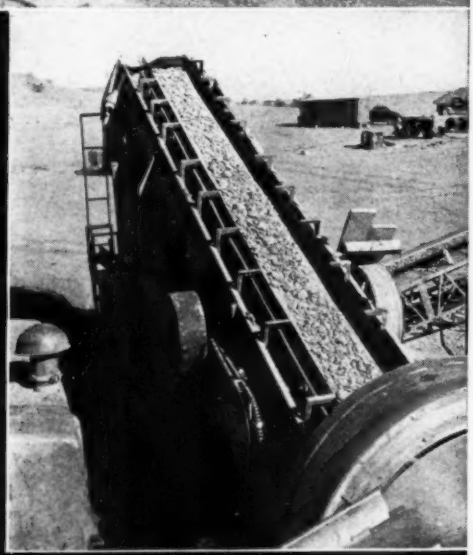
"Purple Strand" means that the rope is made of "Improved Plow" steel, the strongest, toughest steel used in wire-rope manufacture.

"Form-Set" means that the wire rope is preformed, making it not only rugged but far easier to handle. Preformed wire rope gives longer service because it is much better able to stand bending fatigue.

Form-Set Purple Strand is Bethlehem's top-quality wire rope. It is made in all sizes and constructions. For the utmost in flexibility and ruggedness, and long service life, call for Form-Set Purple Strand.

Over 500,000 Yards of Gravel Per Year!





Success stories of Universal plants are many. Typical is the one recently received from Cage Bros. & J. Floyd Malcolm, Texas, gravel producers. They have given us the following report on their Universal Gravel Crushing, Screening and Loading Plant:

Maximum yardage per hour: 400 yards of material 2" and under.

Average production in continuous operation: 275 yards per hour.

Average annual production: over 500,000 yards.

This compact portable plant consists of a 1036 primary jaw crusher, 40"x 24" secondary roll crusher, 2½ deck 4'x 12' screen, rotovator and conveyors—a lot of gravel produced with a minimum of equipment.

Ask any user of Universal equipment about production costs, fuel consumption, bearing life, maintenance costs and other operating factors. *When results are checked, Universal is the choice!*

UNIVERSAL ENGINEERING CORP.
610 C Avenue, West Cedar Rapids, Iowa

Get Behind the A.R.B.A.!

Officials of the American Road Builders' Association have issued a plea to members, affiliated organizations and other interested parties to launch a well integrated post-war highway building program at once so that the wheels can be set in motion immediately upon conclusion of the war.

A copy of "A Sound Plan," detailing the program to hedge against post-war deflation is available to those interested, from the A.R.B.A., 1319 F St. N. W., Washington, D. C.

ARMY E NAVY

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

A

At Your Service

Whenever you have a dirt-moving problem, get in touch with the nearest District Office or Distributor listed below. The entire experience and facilities of these members of the Bucyrus-Erie organization are available for your use in getting new or used equipment, and in getting the most in performance from the equipment you now have.

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- DRAGLINES
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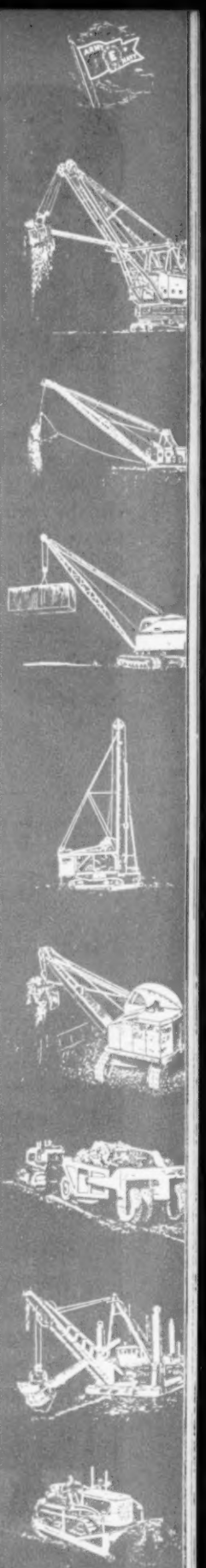

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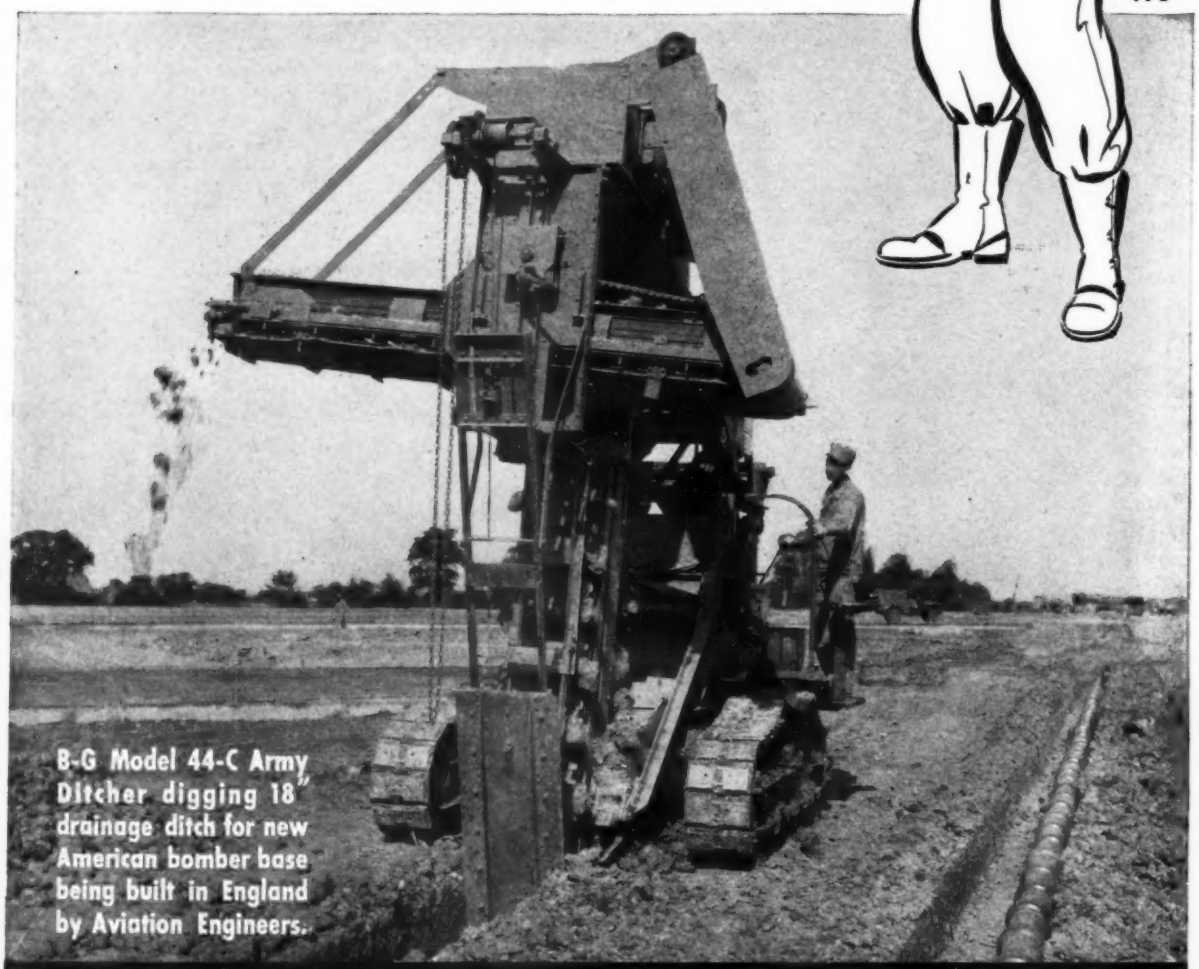
"Jest ain't the same war

That squad of pick and shovel experts of World War I isn't around for this War. Instead, there is a squad of B-G Ditchers digging faster and twenty hours a day.

Yes sir, it's a different war. Eight-foot trenches or two-foot drains, clay or rocks, it's all the same—the old shovel squad is mechanized. Better ditches, too, smooth sidewalls and straight as a bazooka barrel. Digging trenches in this war is as easy as chauffering for the general. Write for B-G Catalog 44.

44-5



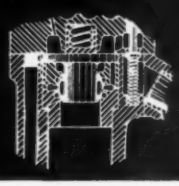
B-G Model 44-C Army Ditcher digging 18" drainage ditch for new American bomber base being built in England by Aviation Engineers.

BARBER GREENE

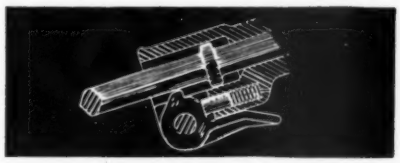
AURORA, ILL.

Thor No. 25 PAVING BREAKER

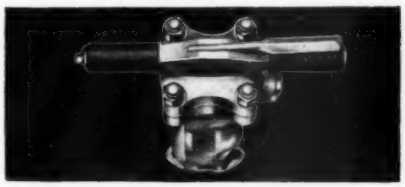
These THOR Features Speed Heavy Demolition Jobs!



• **Positive Short-Travel Tubular Valve**—Gets every ounce of power from every foot of air entering the machine. Actuates a block type piston that minimizes vibration to provide handling ease. Provides low air consumption.



• **Latch Type Retainer**—Simple, fast and easy to operate. Spring detent holds retainer in closed position . . . Pressing with the foot releases the tool. No adjustment is required during insertion of the tool.



• **4-Bolt Back Head**—Special design maintains rigidity between the back head and cylinder, eliminating air leakage and excessive bolt breakage when machine is used for prying. Made of drop forged, heat treated alloy steel. Equipped with rubber grips that keep the handle cool at all times.

BUILT for Heavy Duty . . . DESIGNED for Fast, Easy Handling

The Thor No. 25 Paving Breaker is the heavy duty "boss" of the Thor demolition crew . . . *built* for the hardest kind of jobs, yet *designed* to provide handling ease that gets those jobs done faster.

Ruggedly built from alloy-steel drop forgings, equipped with a sturdy 4-bolt back head for maximum strength and rigidity, this heavy duty Thor Breaker combines *operating ease* with *power* to make quick work of the toughest demolition jobs in pavement, walls, columns, piers, foundations and the like.

For more information about this powerful, easy operating, heavy duty Thor No. 25 Paving Breaker and full details about light and medium duty Thor Breakers in the *complete* Thor line of contractors air tools write today for Catalog 42-A.

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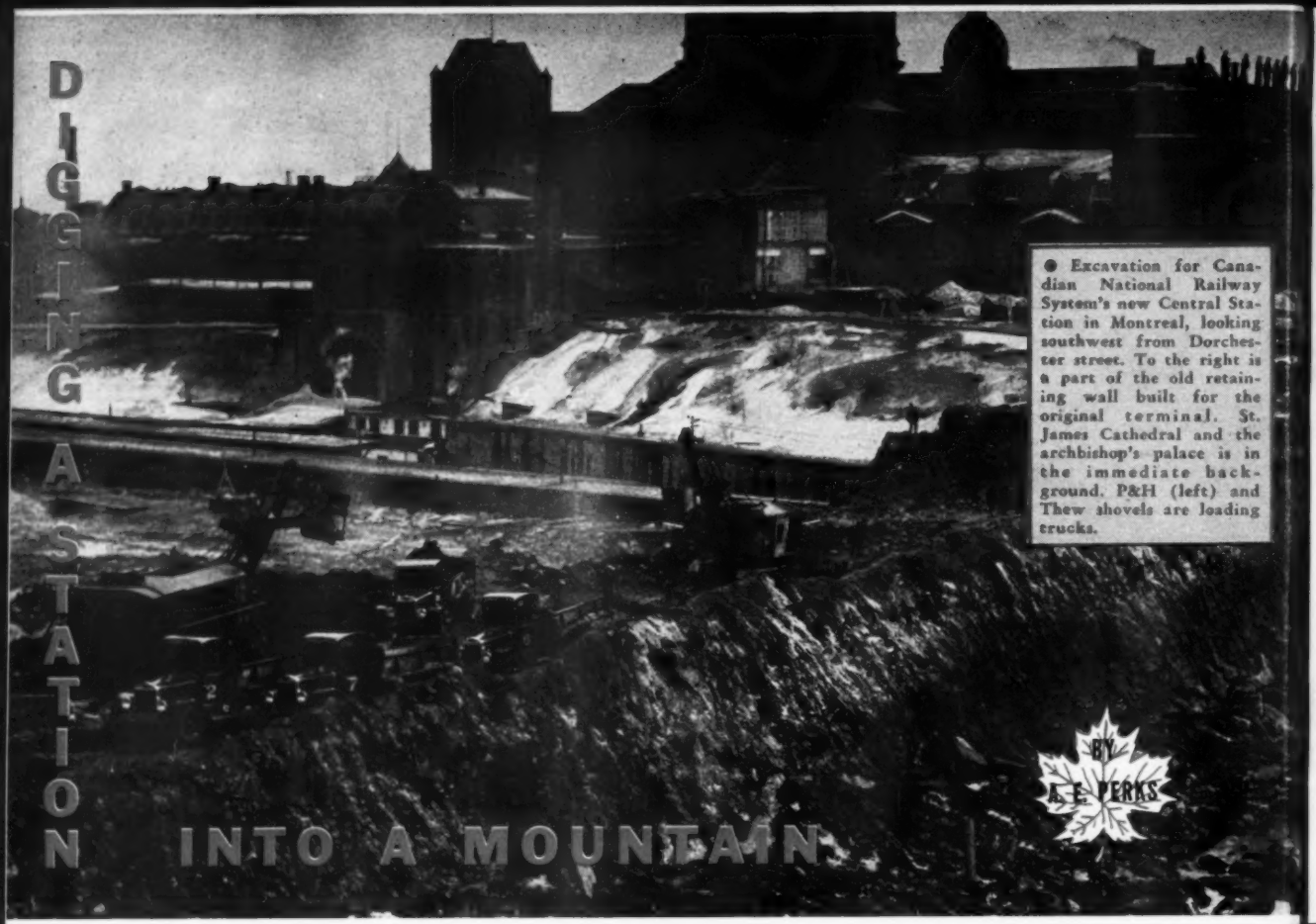
DIGGING A STATION INTO A MOUNTAIN



● Excavation for Canadian National Railway System's new Central Station in Montreal, looking southwest from Dorchester street. To the right is a part of the old retaining wall built for the original terminal. St. James Cathedral and the archbishop's palace is in the immediate background. P&H (left) and Thew shovels are loading trucks.

BY A. E. PERKS

Canadian National Railway System builds terminal in excavated volcanic mountainside in Montreal. Train schedules not interrupted during work.

A MILLION and a half tons of earth and rock were dug out of the lower slope of what was once a volcano, to provide room for the building of the terminal station which the Canadian National Railway System officially opened early last summer.

The task was somewhat complicated by the fact that there already was a station on the site, and trains had to be kept running in and out of the station without interruption while the digging was going on.

The Canadian National Railway System, a wholly government-owned corporation owning and operating about 24,000 miles of main line track, had three terminal stations in Montreal. None of these stations was considered adequate to handle anticipated increased traffic, so about 1927-28 it was decided to use the station on the lower slopes of Mount Royal as the site of a new terminal to take care of all the traffic, and to make subsidiary freight terminals out of the other two.

To get the picture of this job properly, it must be remembered that Montreal is built around the slopes of Mount Royal which, according to geologists, was in the distant past, the core of a volcano. Its rock structure consists of Trenton limestone and Essexite, with igneous dykes. The existing small station was built on the southern slope, at the southern portal of a tunnel which goes through the mountain.

The tunnel is 3-1/10 miles long, 23½ feet high by 31 feet wide, 650 feet below the summit of the mountain. At Cathcart street, which runs east and west, on 20 feet of coverage above the portals to the tunnel, street level is 41 feet above track level. At St. Catharine street, the next street north, street level is 47 feet above track level. At Dorchester

● A general view of Montreal's commercial center with new Canadian National station and train sheds to the left center. The tall building to the right is the Bell Telephone building and in the center background, immediately behind the station, is the Sun Life Assurance Company building.

street, the first east-west street south of the tunnel portal, and one of the streets from which entrances led to the old station, the distance was 51 feet to track level. Going still further south, Lagauchetiere street is approximately 20 feet above track level, and provided the main entrance to the old station.

Begin Digging in 1929

Work began on the digging of the new foundations late in 1929. In 1930, by order of the government, it was stopped. In February, 1939, it was started again. By May, 1939, the concrete men had started pouring foundations and in August, 1940, the last of the excavating was finished.

When complete, the excavation was 88 feet deep at its lowest point, and averaged 45 feet depth all over. It was 650 feet long and 104 feet wide. About half of the excavating was rock and half was earth.

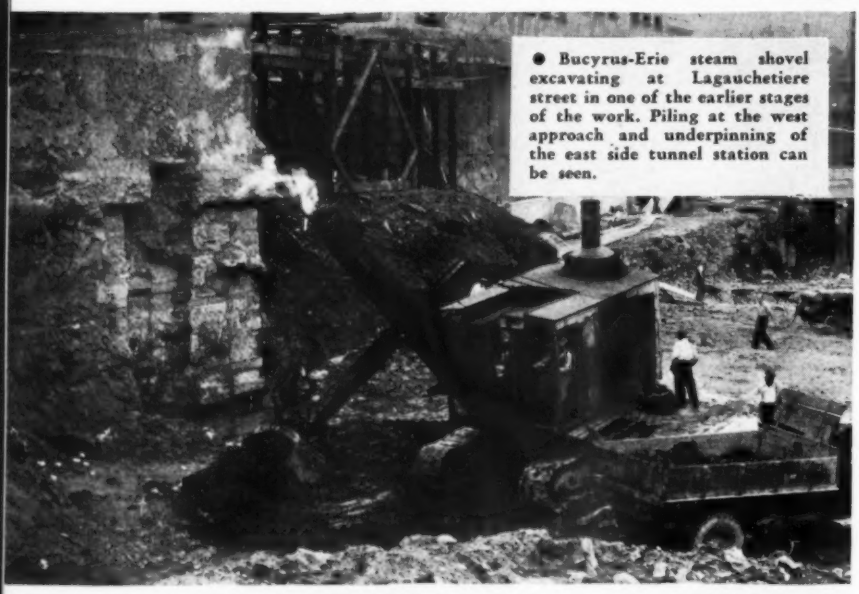
The reason for picking this particular site for the new station to bring the lines in from all parts of the city to the lower terminal, rather than the lower-lying site of Bonaventure station to the south-west of the tunnel-terminal, was to avoid the necessity of cutting trenches through fairly long distances of ground which previous experience had shown to contain a great deal of quicksand and to be subject to a lot of water seepage from the higher levels on the mountain. Also, it would not have been feasible to bring the lines now entering Moreau street into Bonaventure in any way. The lines now entering Moreau street will be brought into the new Central Station through the proposed construction of a 16-mile line from the eastern end of the Island of Montreal to connect with the tunnel line. It is expected that this new line, which it is estimated will cost $2,870,000, will be completed during 1944. The route has been surveyed and the land acquired or expropriated. The mountain side also provided an entrance from the north through the tunnel, and from the south, by an elevated embankment,

● View of the new station from East street, the new Montreal thoroughfare that was made possible by the building of the station.

● Holes for six feet square concrete pillars for a reinforced concrete platform were carved in the rock bottom of the excavation with 80-lb. jackhammers operated by Ingersoll-Rand portable compressors.

● Starting the fourth stage of excavation in 1940, this Bay City shovel loads out topsoil covering rock to be excavated.

● Thew 2-cu. yd. steam shovel (right) and Buckeye ¾-cu. yd. gas shovel working on the early stages of the northeast corner of the excavation.



● Bucyrus-Erie steam shovel excavating at Lagauchetiere street in one of the earlier stages of the work. Piling at the west approach and underpinning of the east side tunnel station can be seen.

● Thew 2-cu. yd. steam shovel working on the rocky north face of the excavation early in 1939.

connecting the southern exit of the terminal with Victoria bridge which crosses the St. Lawrence river.

The portal of the tunnel is 115 feet above sea level and 650 feet below the summit of the mountain. There is 0.6 per cent grade on the tunnel, from the entrance upward toward its northern exit.

There was no extraordinary rush about the job, and throughout, only one shift a day was worked. All the work was done under contract, and the whole job was supervised by C. B. Brown, consulting engineer of the Canadian National Railway System, who has recently retired. Charles Arthur Duranceau, C. E., was contractor for a good deal of the excavating work with supervision being done by Canadian National engineers. Mr. Duranceau also was contractor for the pouring of the concrete foundations and building the platforms which involved nearly 60,000 tons of concrete.

Excavating Next to Station

The double track line coming into the original station was laid on the ground, at the level of the tunnel entrance. In the new station the tracks are on a reinforced concrete platform over a big basement which is used for baggage, mail and express rooms and other auxiliary services of the railway. Excavations had to be dug alongside of the existing station, to provide for a much larger station and 16 tracks instead of only two and underneath the existing tracks to provide basement space and the foundations of the big station. The trackage laid for the new station was carried on while service from the original station was maintained, and the tracks of the original station were included in the new set-up.

In the first part of the excavation work, 1929-30, a number of diesel and gasoline shovels were used. Excavated material was hauled by 40 Chevrolet, Dodge and Ford dump trucks of two to three tons capacity on a natural earth ramp to the level of the nearest street and disposed of in two ways. Part of the earth and rock excavated was used to build an elevated embankment from the southern exit of the new terminal to Victoria bridge which crosses the St. Lawrence river and connects Montreal Island with the mainland. A good deal of the excavated material was used to build this embankment for the elevated track and the balance of excavated material was taken to the Point St. Charles district of Montreal where the Canadian National Railways system has its yards. The excavated material was used as fill

to grade additional land for the location of a new and improved passenger coach yard.

The hauling distance from the station outlet to Victoria Bridge is about 1¼ miles and the hauling distance for the embankment was longer or shorter according to which point of the embankment the material was dumped. The material used for fill in the C.N.R. yards was hauled about two miles from the point of excavation. Scrapers were used to grade the fill in the yards.

Seven Shovels Used

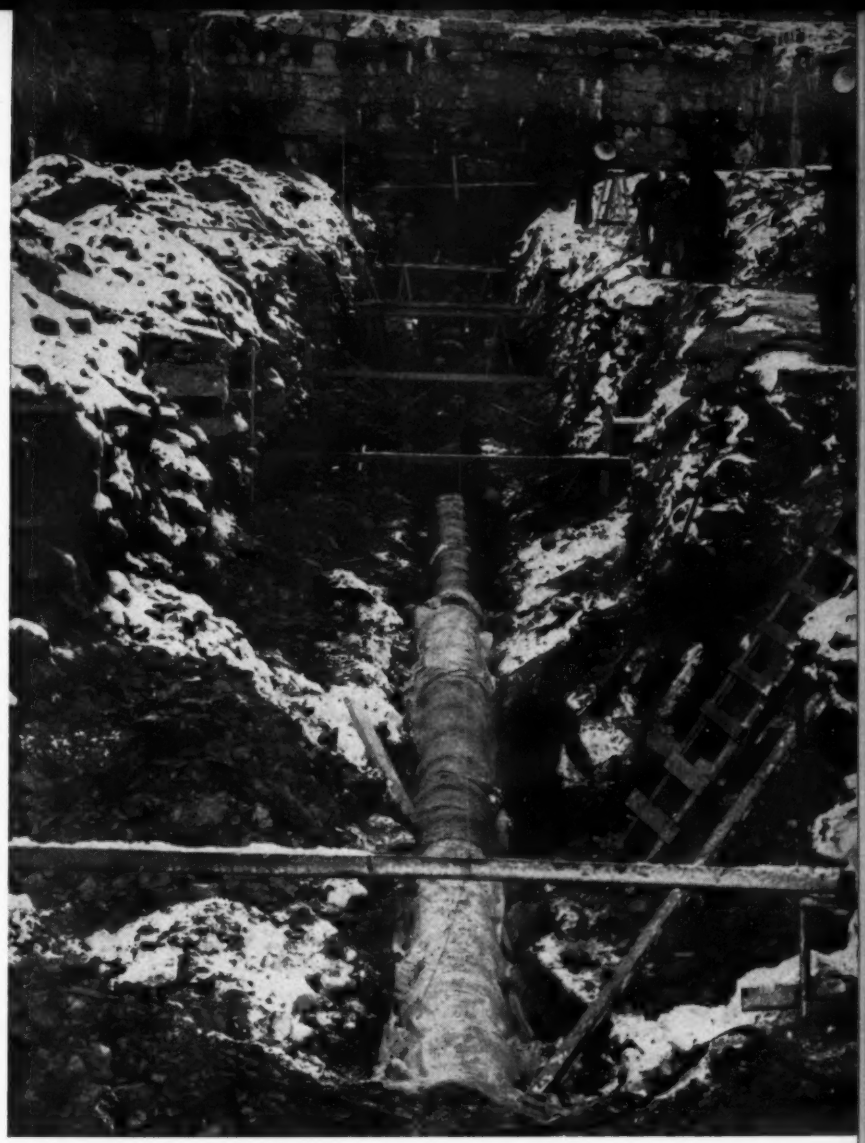
The tracks were 41 feet below street level at the tunnel entrance. Therefore east and west of the then existing tracks there was a straight forward excavation of 41 feet depth, before getting to the level of the railway and of the little station that was then the terminus. When the project was resumed in 1939 after nearly nine years lay-off, the excavating work was in, around and underneath the original tracks, and was done with seven shovels ranging in size from ½-cu. yd. to 2-cu. yds. Shovels used in the second stage of the job included a Bucyrus-Erie 1½-cu. yd. gas-air shovel; a 2-cu. yd. Thew steam shovel; a ¾-cu. yd. Buckeye gasoline shovel; a ¾-cu. yd. Bucyrus-Erie gasoline shovel and a ½-cu. yd. Dominion Engineering diesel shovel, P&H and Bay City.

Manganese teeth were used on all of the shovels and stoppages for repairs were kept at a minimum by having a well-equipped workshop with two or three mechanics available for handling repair jobs.

Once the excavation reached the level of the tracks, a temporary side track was laid to divert the trains to the west of the original tracks and bring them in on a curve to their original platform. The original tracks were taken up and excavation was pushed ahead in the area east of the temporary tracks. As soon as the required depth was reached a bridge was built, which was ultimately to be a part of the new station. Reinforced concrete pillars six feet square were set in holes carved in the rock-bottom with three Ingersoll-Rand wagon drills and 80-lb. jackhammers operated by three Ingersoll-Rand portable 105 cu. ft. compressors. A reinforced concrete platform was placed on these pillars. The tracks were then moved back to their original position, now resting on the concrete platform instead of on ground, and excavating went on in the section west of the tracks, that is, the section from which the temporary tracks had been moved.

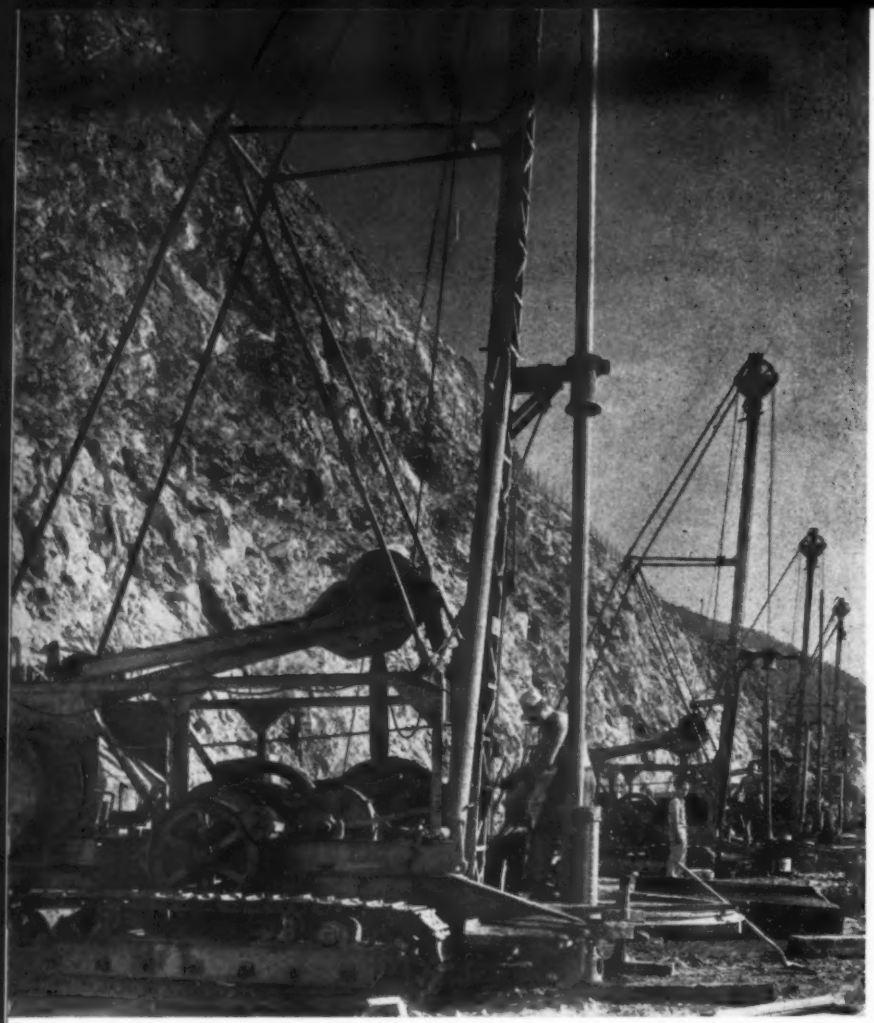
By this time, the pouring of concrete in the foundations was proceeding; at one side of the excavation,

(Continued on page 276)



● **18-inch V. T. sewer, north end, looking east from base line. Drainage is a serious problem in Montreal because snowfalls, averaging between 80 and 140 inches a winter, are liable to melt quickly and produce an unusually big rush of water in Spring.**

● **P&H 2-cu. yd. shovel loading out concrete from the old retaining wall built for the original station. The wall was broken up by 40 per cent dynamite charges and hauled away to provide room for the additional tracks laid on this site.**



● Four Bucyrus-Erie 29-T electric blast hole drills owned by West Slope Construction Co. in operation at San Gabriel Dam No. 1.

Blast Hole Drill Care and Maintenance

The blast hole drill, like all other equipment on the job, requires regular and continuous attention to meet ever-increasing demands for greater output. Shortage of skilled labor and difficulty of getting replacement parts makes care and maintenance a serious problem.

By A. C. HAISCH

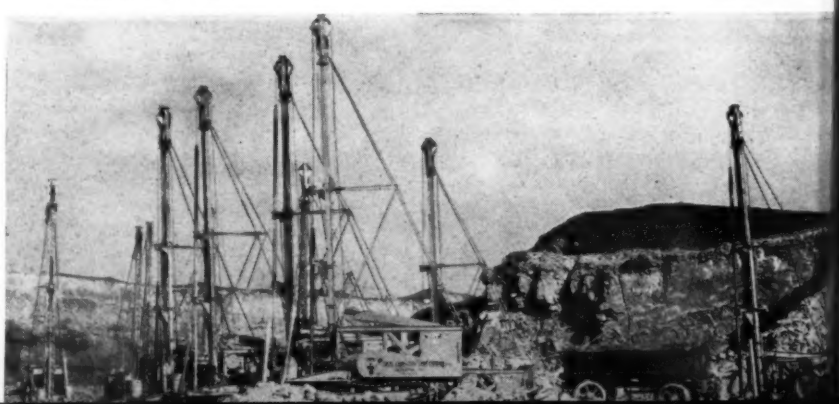
(Bucyrus-Erie Co. Engineer on Drilling Equipment)

BLAST HOLE CHURN drills are playing an important part in the war effort by performing a basic operation in the procurement of essential and critical materials. The great majority of these materials cannot be excavated in their natural state, and it is necessary to drill and blast them before they can be loaded and transported for processing.

The churn drilling method, which dates back to ancient times, has undergone little change since its conception. Other methods of drilling have been devised to meet special conditions, but most of these are confined to drilling soft materials, and none, with exception of the small diameter pneumatic drills, have successfully competed with the churn drill method of drilling hard rock encountered in the blast hole field. Although there has been little change in method, the churn drill itself has been greatly improved. Most of these improvements have been made in recent years and include the all steel construction and the use of the wire rope drill cable. The trend is toward more efficient machines with improved mechanical and operating refinements, and greater tool carrying capacities.

The application of churn drills to quarrying and open pit mining methods brought about the development of a specialized machine known as the Blast Hole Churn Drill, which has as its predominant feature the self-propelling crawler mounting. Today, these machines are built in several sizes, permitting the drilling of blast holes ranging in size from a nominal six inches up to 12 inches in diameter. The advantage of the larger diameter hole lies in the increased explosive capacity which allows a proportionate increase in spacing of hole centers and a decreased drilling cost per ton of rock blasted. The weight of drilling tools used on these machines varies from approximately 1500 pounds for the smaller sizes up to 6000 pounds for the largest size.

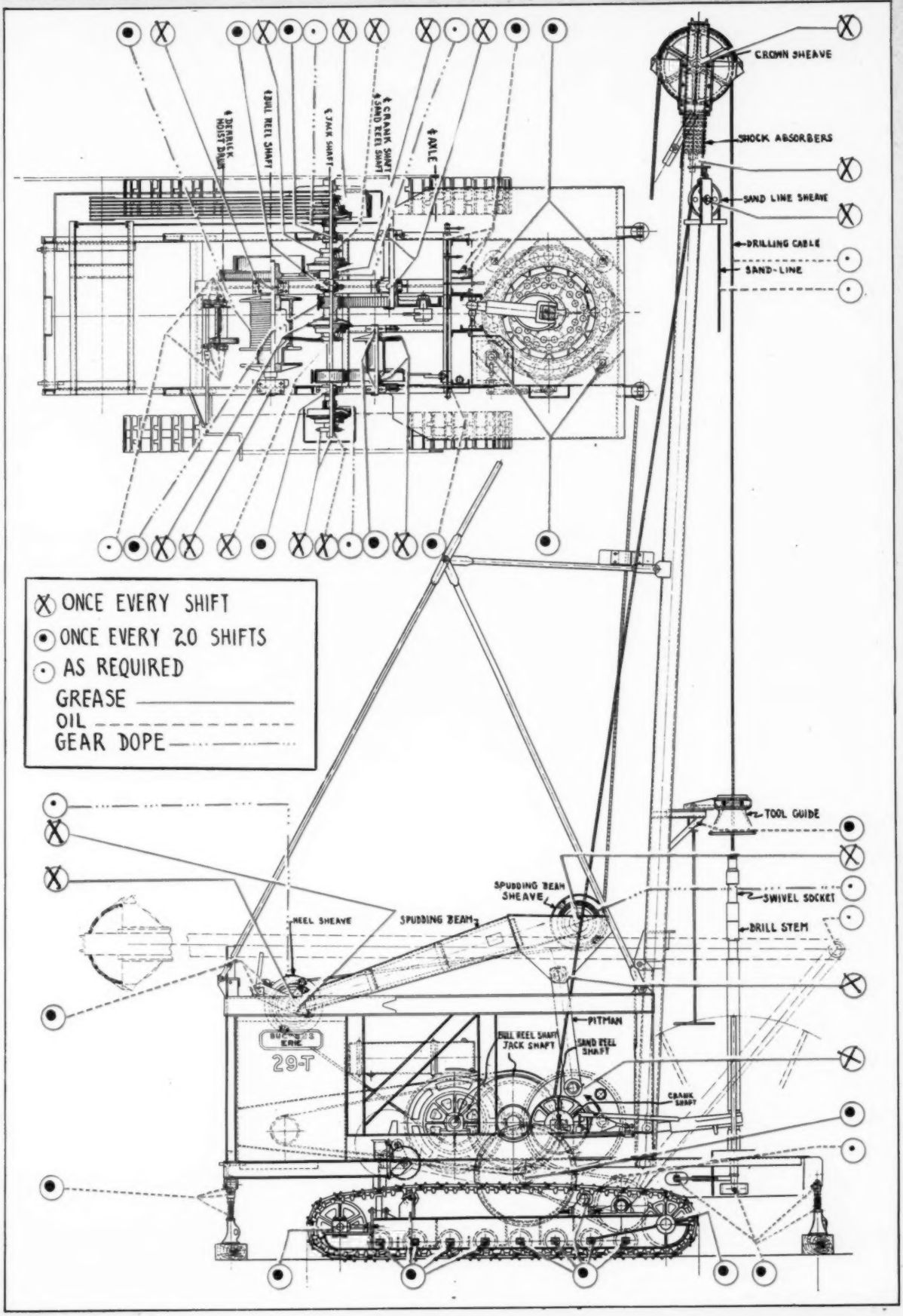
● Dick Construction Co. uses Bucyrus-Erie 42-T and 29-T blast hole drills in coal stripping operations at Locust Gap, Pa.

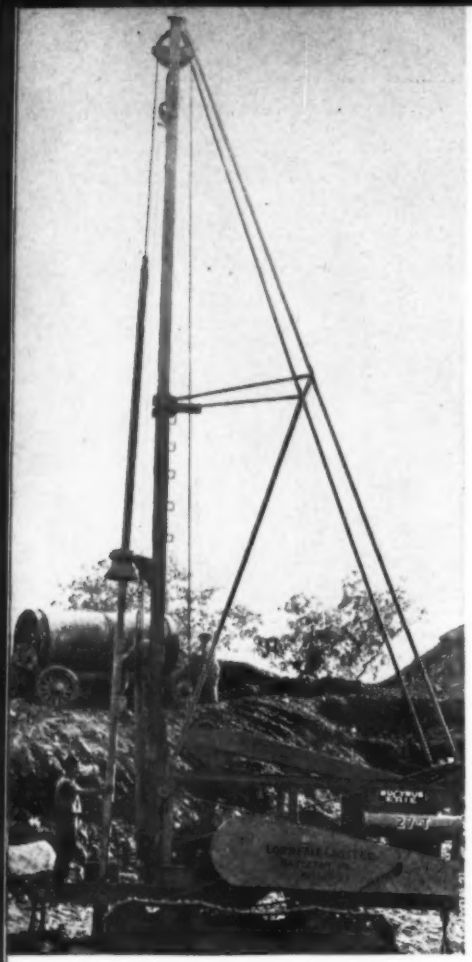


Continuous Operation

The blast hole drill, like all other equipment on the job, requires regular and continuous attention. Under present conditions of ever increasing demand for greater output, the shortage of skilled and responsible labor, and the difficulties in obtaining replacement parts, proper maintenance

BUCYRUS-ERIE BLAST HOLE DRILL LUBRICATION CHART





● A clean machine is the first requisite for proper servicing for it encourages everyone connected with it to give it better care.

becomes a very serious problem. There is only one solution and that is to give the equipment the best care possible to keep it running. This applies particularly to the drills, since a shut-down in this department, even of short duration, may seriously curtail production of the entire operation.

The drill manufacturer customarily supplies instructions on the proper care and maintenance of his product. In general these instructions are followed, but in some instances, they are pigeon-holed, and the care of the machine is left to the tender mercies of the operator. So that maximum results may be obtained from the equipment a definite program must be set up and followed for regular and complete servicing. In smaller operations, where the equipment is limited to two or three machines, and where there is little labor turn-over, it has generally been found practical to place the day-shift driller in charge of maintaining his machine. In larger operations, however, it is advisable to provide a maintenance personnel, consisting of one or more men, whose duty it would be to attend to the complete servicing of each machine. It would not be necessary that the maintenance personnel spend its entire time on this work, but it is important that it be responsible for the condition of the drills. This relieves the superintendent from maintenance details.

A clean machine is the first requisite for proper servicing, for it encourages everyone connected with it to be more inclined to give it better care. Repairs and adjustments are more easily performed on a clean machine and a periodic inspection for points requiring attention are facilitated. Provision should be made to repaint the machine at least once a year, or more frequently when conditions are severe.

Lubrication Most Important

Lubrication of machinery parts is the most important item of servicing. Any part which slides or rolls upon another generates friction. Unless a lubricant is placed between the surfaces of contact to hold them apart, the friction generated will eventually cause wear and destruction of these parts. There is as yet no universal lubricant. The correct lubricant for any application depends upon the type of service. All major oil companies have developed special lubricants to give satisfactory service for the principal applications.

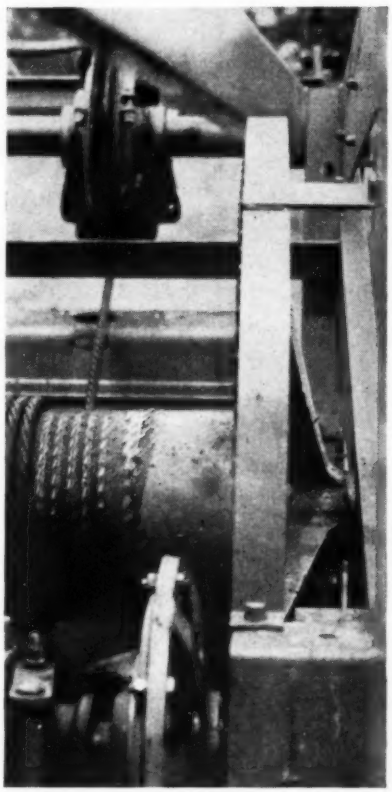
Lubrication of a drill is confined to bearings, gears, drive chains, drum surfaces, sheave grooves, and cables. Plain bearings require frequent grease lubrication, usually once per shift, dependent upon the frequency of service. Anti-friction bearings require less frequent attention. The teeth on open gears and pinions require a lubricant very different from that used on bearings. The compound used is commonly referred to as a gear dope, and is usually a hard tar-like substance which must be heated before application. It is usually applied with a small paint brush, and because this requires considerable time, gear teeth are lubricated none too frequently. For this reason, it is suggested that a second method be adopted, that of heating the gear dope in a small ladle and pouring a small stream on the gears while they are in motion. The hot lubricant adheres to the cold gear surface and the mesh of the gears spreads the lubricant out in a thin film which gives excellent service until it is worn off. An application once a week should be sufficient for normal service.

Open drive chains require another lubricant. The recommended type is a free flowing oil which can readily find its way into the roller pins. The oil must have good adhesive properties, and should not become too stiff or form a sludge under reasonable low temperatures. The life of drive chains can be materially increased by periodically removing and cleaning them thoroughly.

Drum surfaces, particularly the bull reel drum, and the sheave grooves are subject to wear by the cable. The drums should be coated periodically with gear dope, and this can be best accomplished by brushing it on. The sheave grooves will automatically become lubricated if the cable itself is properly lubricated, otherwise gear dope should also be applied to the sheave grooves.

The method of lubrication of cables has been subject to much controversy. It has, however, been proven that cable life can be materially lengthened by good lubrication. In normal service the cable wear is predominently internal, caused by the wires sliding over one another as the cable alternately stretches under load and retracts.

● Drum surfaces, particularly the bull reel drum, are subject to wear by the cable and should be coated periodically with gear dope.



Cable manufacturers recommend an adhesive oil which is sufficiently penetrating to work itself into the cable. Such an oil is similar to that used on the drive chains.

Repairs and adjustments are the remaining items to remember in servicing a drilling machine. Clutches, brakes, chains and crawler treads are wearing parts and require periodic adjustments. After a period of time certain of these parts will wear out. Each user should have a reasonable stock of replacement parts which will permit making immediate repairs when the occasion arises.

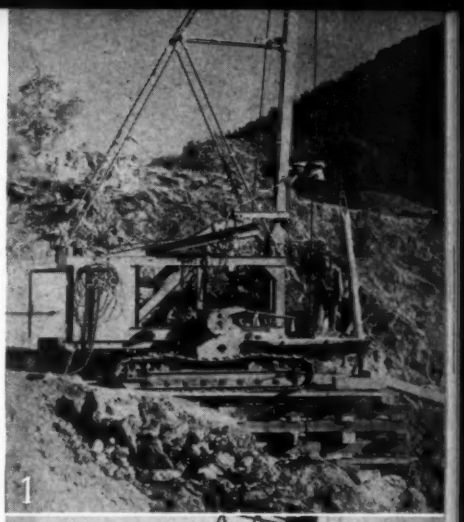
Substantial Foundation

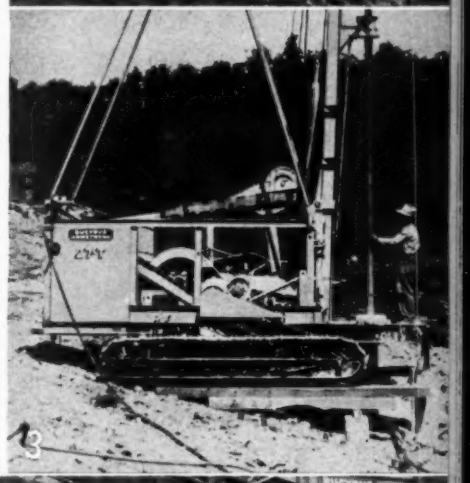
One item in drill maintenance which is most frequently overlooked, but which is of considerable importance, is that of properly setting up the machine preparatory to drilling. This is actually an operating problem and affects production as well as maintenance. The drill must not only be set up level to obtain good performance, but the foundation under the machine must be substantial as well. In some operations, where drilling is performed on a level rock floor, the conditions are ideal. In most cases, however, the drill must be set up on a rough rocky floor or on relatively soft earth. The operation of a drilling machine involves alternately raising and dropping the drilling tools which may weigh as much as one ton or more as frequently as 50 to 55 times per minute. This action results in considerable impact on the machine, and while every churn drill is equipped with shock absorbing devices to reduce the intensity of the impact, high loads are none the less present in the various machine parts and frame members. Unless the machine has a substantial foundation under each support, the frame members will not carry their proportionate share of the load, and certain of the members will be overloaded. The result will be noted in the bending and twisting of frame members, and eventually cracks and failures will develop.

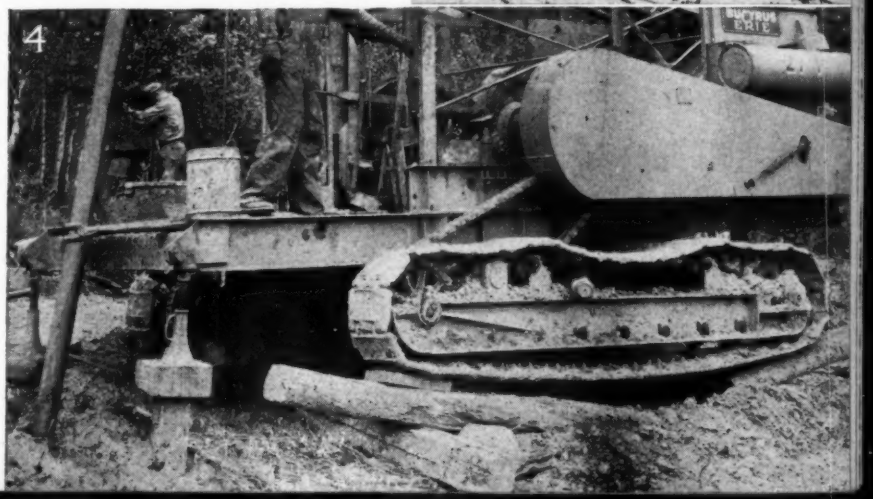
In testing metals for fatigue, experience has indicated that a specimen which does not fail after 10 million cycles of a repeated high stress, is not likely to fail. By increasing the load, say 10%, the specimen is likely to fail after only several hundred thousand cycles. In terms of service on a churn drill operating at 50 strokes per minute for 10 hours per day, the frequency of repeated stress in a frame member would be the equivalent of 300,000 cycles in 10 days. If the repeated stress in some of the frame members is sufficiently great, a failure might occur within this period of time. While drilling machines are designed with a conservative factor of safety, the impact loading of certain members may be so great under unfavorable conditions that failures may result after a relatively short period of time.

Setting up and leveling of the machine on irregular ground can frequently be simplified by choosing the best approach to the next drill hole location. Whenever it is necessary to use blocking to level up the machine for drilling, reasonably square and sound hardwood timbers should be provided for this purpose. When possible, at least one corner of the crawler treads should rest on rock surface, and no more blocks than necessary should be used. Small blocks or partially rotted timbers will crush out and should not be used.

A poor foundation under the drilling machine not only increases maintenance costs, but it also reduces operating efficiency. A machine which does not have solid supports will rock and sway causing a whip in the drilling line which tends to disrupt the rhythm of the drilling motion and in severe cases may retard progress by 25%.



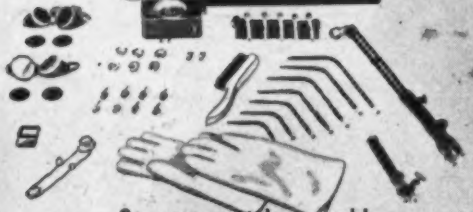




● **Properly setting up the machine preparatory to drilling is an operating problem which affects production as well as maintenance. The drill must be set up level to obtain good performance and unless the machine has a substantial foundation under each support, the frame members will not carry their proportionate share of the load, causing bending and twisting of frame members which will eventually result in cracks and failures. Pictures 1, 2 and 3 are good examples of the use of proper blocking. Picture 4 shows poor foundation that will increase maintenance costs and reduce operating efficiency. The small blocks and cracked timbers used are liable to crush out and small blocks under jacks do not provide an adequate base. Support is only on ends of crawler treads.**

YOUR EQUIPMENT IS HE

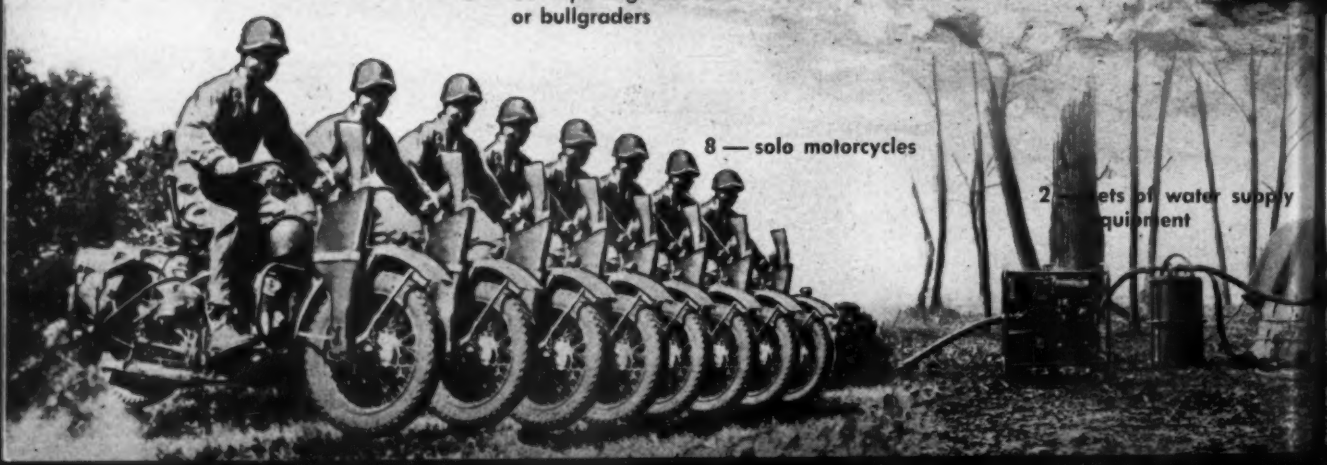
4 — ¼-ton trucks (jeeps)



2 — oxy-acetylene welding sets

2 — ½-cu. yd. gasoline shovels

8 — 35 h.p. angledozers or bullgraders



8 — solo motorcycles

2 — sets of water supply equipment

LPING US WIN THE WAR

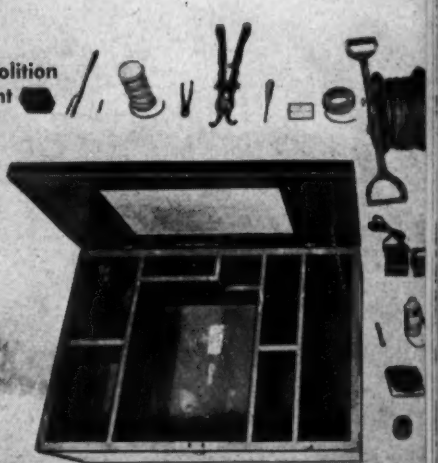
11 — ¾-ton command cars

2 — 6-ton prime movers with winches

20 — ¾-ton weapon carriers

1 — earth auger

18 — sets demolition equipment



This pictorial review of the kinds, sizes and amounts of construction equipment each General Service Regiment of the U. S. Engineers, comprising Regimental Headquarters and a Service Unit and six Companies, takes into the field graphically answers the question—Why can't I get equipment for my jobs?

In addition to the equipment pictured here, each General Service Regiment has eight 2½-ton cargo trucks with winches, 24 2½-ton dump trucks with winches, one 4-ton wrecker with winch, one 5 kw. lighting set, and 18 sets of demolition equipment. The complete list of equipment taken into the field by each General Service Regiment of the U. S. Engineers is as follows:

- 11—2½-ton cargo trucks
- 8—2½-ton cargo trucks with winches
- 24—2½-ton dump trucks with winches
- 8—4-ton cargo trucks with winches
- 1—4-ton wrecker with winch
- 2—6-ton prime movers with winches
- 20—¾-ton weapon carriers
- 34—1-ton trailers
- 11—¼-ton command cars
- 4—¼-ton trucks (jeeps)
- 8—solo motorcycles
- 8—35 h.p. angledozers or bullgraders
- 8—equipment trailers (for angledozers or bullgraders)
- 2—motor graders
- 2—½-cu. yd. gasoline shovels
- 1—motor repair shop
- 1—earth auger
- 8—air compressors with air lines and tools
- 1—5 kw. lighting set
- 2—sets of water supply equipment
- 2—oxy-acetylene welding sets
- 1—electric arc welding and cutting set
- 6—gas-driven chain saws
- 18—sets demolition equipment

(Continued on page 244)

Your Equipment

(Continued from page 243)

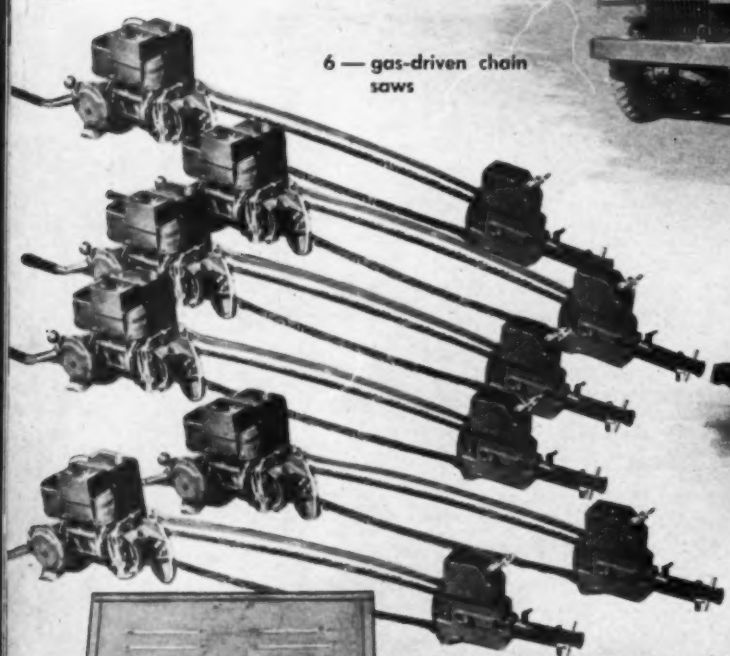
In addition to the above list of regular field equipment, Service Regiments may be assigned to special tasks which require other equipment which is assigned by one or more of the Dump-truck Companies, or by an Engineer Equipment Company. Engineer Equipment Companies take into the field such special equipment as concrete mixers, pavers, cranes, large shovels, rock crushers and gravel-screening plants.

Among other specialist engineer companies are Heavy Shop, Parts Supply, Maintenance, Depot, and Petroleum Distribution and Utility Detachments and Gas Generating Units.

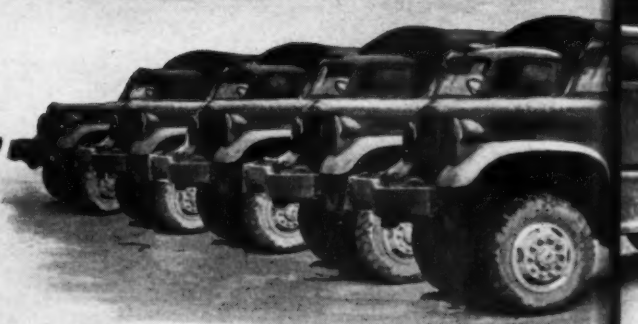
While not all the equipment used by these companies could be directly classified as excavating equipment, much of this equipment is made by manufacturers who normally make excavating equipment—and then, of course, the same type of raw materials are used.

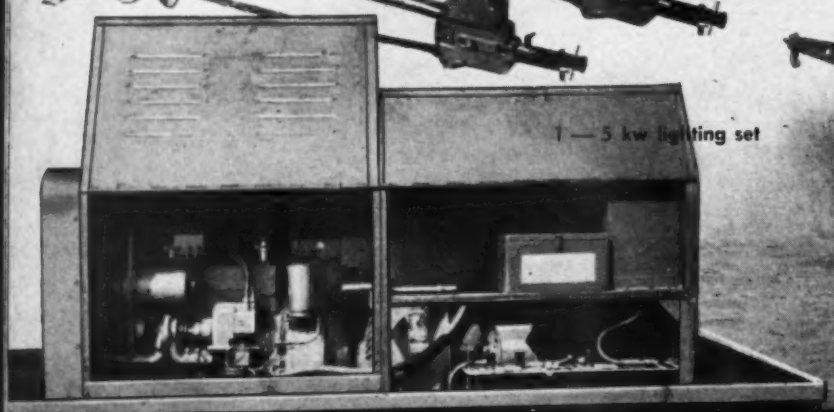
(All pictures used to illustrate this article are U. S. Engineer Corps Photos)

8 — 2½-ton cargo trucks

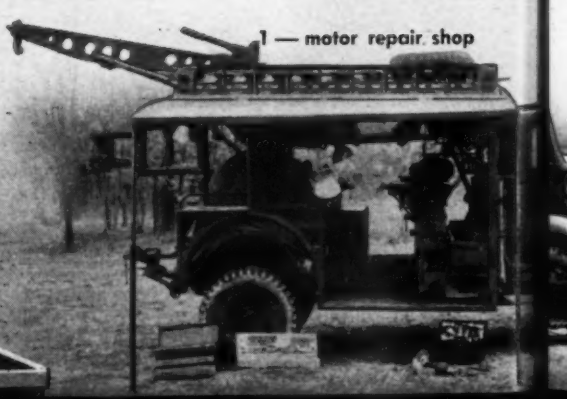


6 — gas-driven chain saws





1 — 5 kw lighting set



1 — motor repair shop

24 — 2½-ton dump trucks with winches

1 — 4-ton wrecker with winch

2 — motor graders

1 — electric arc welding and cutting set

8 — air compressors with air lines and tools

8 — 4-ton cargo trucks with winches

8 — equipment trailers (for angledozers or bullgraders)

34 — 1-ton trailers

Shots from the FIRING LINE

Power Crane and Shovel Shipments for 1943

The number of power cranes and shovels shipped during 1943 totaled 7,218 or more than twice the number shipped in 1937, the earliest year for which comparable data is available. As compared with 1941, 1943 shipments were nearly 45 per cent greater, each succeeding quarter showing an increase over the preceding one. The number of unfilled orders at the end of 1943 was equal to a little more than one year's production at the current rate.

Release of quarterly shipment and order figures on cranes and shovels is in line with the new War Production Board policy of wider dissemination of data which industry can use in business analysis and business planning, now that the production effort has progressed to a point where such data can no longer give any aid to the enemy.

Crawler cranes and shovels accounted for approximately 75 per cent of all power cranes and shovels produced during 1943, while during the period 1937-41 they averaged nearly 90 per cent. The increasing demand for the truck-mounted type accounts for this in part. A few of the important jobs of both types are digging foundations and trenches, dredging, pile driving, lifting and moving dirt, material handling, cargo handling, etc. These duties are all of extreme value to the war program. Each machine is usually equipped with additional attachments which enable the operator to switch from one of these tasks to another at short notice.

Data is based on reports representing 100% of the industry: in 1943, 22 producing companies reported; 26 companies reported for the years 1937-1941.

NUMBER OF CRANES AND SHOVELS

SHIPMENTS

Year and	Quarter	Crawler Mounted	Mounted Truck	Total
1937	Total	2974	312	3286
1938	Total	2260	213	2473
1939	Total	2503	243	2746
1940	Total	3216	378	3594
1941	Total	4191	835	5026
1943	Total	5291	1937	7218
1943	1st	1167	370	1537
	2nd	1238	485	1723
	3rd	1431	497	1928
	4th	1455	575	2030

UNFILLED ORDERS

1943	Dec. 31	5486	2477	7963

Motor Trucks and Truck Tractors Annual Production

Over 37% of the motor trucks produced in the United States in 1943 were in the heavy category, compared with 30% in 1942 and only 17% in 1940 and 1941, according to figures released by the Automotive Division of the War Production Board. The proportion of both light and medium trucks has been declining.

The figures in the following table cover actual production of trucks in the United States for military and civilian, excluding military half-tracks. For 1942 and 1943, light trucks for civilian use were defined as those up to 9,000 pounds gross vehicle weight; medium, 9,000 up to 16,000 pounds gross vehicle weight; and heavy trucks, 16,000 pounds and over gross vehicle

• Bucyrus-Erie Dozershovel aids U. S. Marines in the unloading of bombs from a LCM at Roi during the Marshalls invasion. The hydraulic cylinders give the Dozershovel the appearance of being armed with two cannons.

Official U. S. Marine Corps Photo.

3,200 HOURS!

From One VELVETOUCH Master Clutch Facing

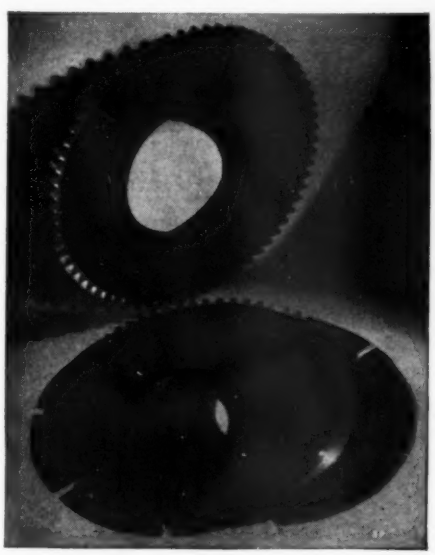
Excavating Contractor Reports Complete Satisfaction With Velvetouch in D-4 Caterpillar

Two and one-half years of dependable, smooth performance . . . and still good for many additional trouble-free operating hours! That's the story of the Velvetouch facing installed in the master clutch of a D-4 Caterpillar tractor, owned and operated by Gerl Bros. Excavating Company of Euclid, Ohio.

Andrew Gerl, Jr., head of the firm, sums up his opinion of Velvetouch in one sentence: "We are now using Velvetouch facings exclusively in all of our earth-moving equipment."

VELVETOUCH IS ALL METAL . . . made entirely from compressed powdered metals, welded to steel backing plates. And because Velvetouch is all metal, it wears longer . . . requires less adjustment . . . is little affected by oil or water.

Below: These Velvetouch Bimetallic clutch facings are the type used in the master clutch of the D-4 Caterpillar tractor.



Equipped with a Trackson Traxcavator, this D-4 Caterpillar, owned and operated by Gerl Bros. Excavating Company, really digs into this pile of frozen earth . . . a punishing test for its Velvetouch clutch facing.

For complete details write to:

THE S. K. WELLMAN CO.

1374 EAST 51st ST. • CLEVELAND 3, OHIO

FOR BRAKE AND CLUTCH

USE Velvetouch

BIMETALLIC FRICTION MATERIAL—TRADE MARK REGISTERED

• Power shovels, Buckeye in the foreground and Bucyrus-Erie in the background, load shovels with sand from nearby embankments during the building of China's new Ledo road which will be utilized to bring supplies to Chinese fighting forces.

Official OWI Photo.

weight. In previous years, civilian trucks were classified the same as military trucks based on carrying capacity, with light trucks defined as those up to 1½ tons, medium 1½ to 2½ tons, and heavies 2½ tons and over. The 1943 data are not directly comparable with previous years, but the correspondence is close.

The figures for 1943 are revised from those published originally in "Facts for Industry" Series 3-2-1 to agree with minor adjustments in classification of vehicles.

	Light	Medium	Heavy	Total
1940, Full Yr.	354,150	271,779	124,411	750,340
1941, Full Yr.	439,631	424,215	178,424	1,042,270
1942, Full Yr.	300,840	255,267	241,088	797,195
1943, Full Yr.	268,438	154,987	252,077	675,502
1943—				
January	23,727	7,019	18,639	49,385
February	23,314	6,453	17,553	47,320
March	27,544	8,268	20,065	55,877
April	23,107	9,717	23,273	56,097
May	21,217	12,696	21,244	55,157
June	20,734	14,070	21,658	56,462
July	20,925	16,024	23,321	60,270
August	19,944	17,809	23,520	61,273
September	21,089	16,094	20,254	57,437
October	22,046	17,807	20,145	59,998
November	21,717	15,120	20,132	56,969
December	23,074	13,910	22,273	59,257

Build Airfields on Enemy-held Beachhead

An Army engineer aviation battalion constructed three airfields on an enemy-held beachhead during the invasion of Salerno. The construction of one brand new airfield was accomplished within 12 hours after landing, and two others within seven days.

Four angle-dozers, seven graders, four scrapers, and 22 ton-and-a-half dump trucks, with the help of other assorted engineer equipment, got the job done on time, despite a private battle with the German Luftwaffe and two hurried evacuations to escape breakthroughs.

At the end of 24-hour-a-day operation through that first hectic week, Major Lawrence M. Cook, commanding the battalion, wrote in an official report: "Such construction and transportation equipment cannot be equalled by any other army in the world."

In addition to the above-listed equipment, the battalion had one ambulance, two command cars, eight jeeps, one weapon carrier, five cargo trucks, one prime mover, and two heavy trailers. The additional construction equipment included a motorized air compressor, two water tank trailers, four rollers, and a bituminous asphalt distributor. The total, considered as the minimum for the assignment, was divided among two LSTs. This safety precaution proved of utmost value in the initial operations, when air attack complicated the unloading.

The first LST moved in to shore at dusk on the day of invasion, when assault troops had cleared the Salerno beaches proper of the enemy. To speed up the unloading, the Engineers used their trailers as ramps down to the beach. A ticklish movement came when the rear wheels of one grader slipped off the ramps, endangering the whole operation, but dogged work on the part of the enlisted men completed the unloading by 1 a.m.

Six hours later, the equipment was at work on the first airfield, the site for which had been picked from maps, aerial photos, and study of geologic data. By two in the afternoon equipment from the second LST was on the job also, and by nightfall, in the face of repeated air attacks, the battalion had an airstrip ready for the safe operation of fighter planes.

By 10 a.m. the second day, the major portion of the equipment was moved to the second airfield site. Here more difficult terrain required more earth moving. Despite the close proximity of the enemy, not more than two miles away, and numerous air attacks on the area, work was pushed on into the night. When an enemy breakthrough threatened its capture, the equipment was moved back to the first airfield, but by the morning of the third day the situation was improved enough to return the equipment to the job. Work continued without a halt through the night of the third day, fine grading being done by moonlight. Again on the night of the fourth day the equipment had to be evacuated when another breakthrough was reported and artillery was firing across the airfield site.

On the fifth day, work was begun on the third airfield, where again considerable earth had to be moved. Despite site difficulties, this third airfield was completed for operation, and the assigned mission of three airfields in seven days after landing had been completed.

As the dry soil became powdered under heavy traffic and dust arose in great clouds, the asphalt distributor was used for spreading water, while the rollers compacted and dampened soil. Work progressed continuously with all equipment on a 24-hour-a-day basis throughout the first week and a few days thereafter. Throughout the period no equipment failed to operate through mechanical defect. The rugged construction of the equipment had been

on ROGERS TRAILERS

GETTING there "fustest with the mostest" as one early American General aptly phrased it, is battle strategy that really conquers!

In the lightning speed of mechanized warfare tanks ride "Pick-A-Back" to battle on ROGERS TRAILERS so their fighting capacity is unimpaired. Special ROGERS TRAILERS retreive disabled tanks so they can be repaired and rushed into battle again.

EXPERIENCE builds 'em
PERFORMANCE sells 'em

ROGERS TRAILERS are doing a real war job at home and abroad. New models which will be available to industry when war contracts are completed will be even better-engineered and more efficient than their predecessors.

ROGERS BROS. CORPORATION
ALBION,
PENNA.

HOW ABOUT *Availability* OF CLEVELAND ROCK DRILLS?

Of course, you are well acquainted with the excellent performance and durability of Cleveland Rock Drills. Our purpose here is to inform you of the prompt delivery we can make on this equipment.

MODEL H111—Leader in the 55-pound class for soft, medium, or hard rock. With AA-1 priority, shipment will be made within a week of receipt of order.

MODEL H10—The favorite in the 45-pound class. Despite the popularity of this drill, we are still in position to accept orders carrying AA-1 priority.

MODEL H66—The light drill with the big wallop. With AA-1 priority, we can ship reasonable numbers of this good machine within a week of receipt of order.

Rock drill users, that's the situation on Cleveland hand-held drills. On spare parts we make *immediate* shipment. Be assured that your requirements will always have our best attention.

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The CLEVELAND ROCK DRILL CO.

Division of The Cleveland Pneumatic Tool Company

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LEADERS IN DRILLING EQUIPMENT

proved through many months of continuous operation, for none of it was new.

As Major Cook concluded in his report, "The completely satisfactory performance of such equipment is so often attributed almost exclusively to skillful operators and mechanics; however, full credit must be given to those who designed and constructed such equipment that can stand the gaff in any assignment."

Kentuckians Will Vote on Diversion

Citizens of Kentucky will vote in that state's 1945 elections on the question of amending the state constitution to dedicate highway funds to highway purposes. The recently-closed session of the Kentucky Legislature gave the people an opportunity to vote on this proposal which has been adopted in 14 states.

Report Inventory of Used Construction Equipment

Only two per cent of used cranes, shovels, track-laying tractors, and motor graders now registered by contractors and distributors under Order L-196 are available for sale and only four per cent are available for rental, the War Production Board's Construction Machinery Division reported. As of March 1, 1944 the inventory of used construction machinery owned by contractors and distributors listed 22,615 track-laying tractors; 4,788 motor graders, and 16,444 cranes and shovels.

Due to the heavy demand by the military for these types of equipment, practically all domestic needs must be filled from used equipment. The present small percentage of items available for sale or rental indicates the necessity for having all registrations filed promptly by contractors and dealers as required by the order, and for putting all idle equipment into service through sale or rental, the Construction Machinery Division said. Substantial quantities of track-laying tractors of various sizes are needed by farmers and by the mining, logging, and petroleum industries.

To make certain that available used equipment will be sold to fill the most essential uses, L-196 requires that WPB authorization be obtained prior to sale, with certain exceptions. This provision was added to the order in January, 1944.

Registration and application for authorization to sell types of equipment covered by L-196 must be made in the nearest WPB regional or district office where a construction machinery specialist is stationed and where construction machinery inventory files are maintained. Specialists are attached to all regional offices except Detroit (Region XI), and to five district offices. The Detroit area is covered by Chicago (Region VI).

Offices where registration and authorization applications are filed follow: Regional offices; Atlanta, Boston, Chicago, Cleveland, Dallas, Denver, Kansas City, Mo., Minneapolis, New York, Philadelphia, San Francisco, and Seattle; district offices—Charlotte, N. C., Cincinnati, Los Angeles, Memphis, and Portland, Ore.

Procedure to be followed by contractors and distributors owning equipment covered by the order is summarized by the Division:

(1) Register machinery on WPB Form 1159 within seven days of receipt.

(2) Register change of status of machinery (that is, if now idle, but previously at work, or vice versa) on Form 1333.

(3) Apply for authorization to sell by filing four copies of WPB Form 1319.

Civil Engineers Create Postwar Research Division

To stimulate and assist local private interests and government units in expediting completion of engineering and architectural plans looking toward postwar employment in the construction industry, the committee on postwar construction of the American Society of Civil Engineers on March 31 created a research and development division and appointed Vincent B. Smith, associate editor of Construction

"Can't Say Enough for General Supercranes"

says Henry Selinsky

READY

Here's how easily and economically Contractor Henry Selinsky handles an 80-foot, 3 ton stack with his GENERAL Supercrane, equipped with 100 foot boom.

IN THE AIR **COMPLETE**

Resourceful use of his rubber-tired, one engine, one man-operated GENERAL Supercrane is an everyday occurrence with Contractor Henry Selinsky, of Canton, Ohio. For example—

After a hurricane leveled part of a war plant, Selinsky added an extra 50 feet of boom and passed new girders over other buildings (in which war production continued) to complete the new structure in record time.

This 100 foot boom also made quick work of the setting of a new 80 foot, 3 ton stack (as pictured above) and on another war plant job, he handled 13 ton storage tanks fast and accurately, working at an 18-foot radius.

These are typical of how easily and economically the toughest jobs are handled by General Supercranes. Of GENERAL'S dependability and versatility, Selinsky writes: "I can't say enough for the General . . . it's a real crane." For all the aggressive contractors like Henry Selinsky, General has developed the Supercrane one step farther in engineering the "Machine of Tomorrow" which will set new standards of performance in post-war materials handling and construction.

The OSGOOD COMPANY
Sizes: ⅜ to 2½ Cu. Yd.
Diesel · Oil · Gas · Electric
Associated with The GENERAL EXCAVATOR CO.

The HERCULES COMPANY
HERCULES "IRONEROLLERS"
6 to 12 Tons
Diesel or Gasoline
Associated with The GENERAL EXCAVATOR CO.

GENERAL
Sizes: ⅜-½-⅝-¾ Cu. Yd.
Diesel—Gas—Electric
SHOVELS
DRAGLINES - CRANES
Crawler & Wheel Mounted
THE GENERAL EXCAVATOR COMPANY, Marion, Ohio

BACK OF EVERY ATTACK . . .

Preformed wire rope

Preformed wire rope gives sinews of steel to bulldozers that clear the way so jeeps, planes, and trucks can advance. Preformed is in the fight on practically every kind of mobile war machine.

Men who use Preformed wire rope know that it outlasts and outworks ordinary wire rope. That it handles easier—speeds up operations—safeguards men and equipment.

In the past, Preformed has proved it is the wire rope for the tough peacetime jobs. Today, back of every attack, it is proving that it is the wire rope for the tough war jobs.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR SUPPLIER FOR PREFORMED WIRE ROPE

● Crane hook on boom of Bucyrus-Erie shovel unloading machinery at Hanna Ore Company's Benson Mine in New York.

Methods magazine, executive director. The committee further named Mark B. Owen, of Hastings-on-Hudson, N. Y., to serve as full-time director.

Establishment of the research and development division is the outgrowth of nine months' intensive work by the Society's committee. The American Society of Civil Engineers, a national organization of nearly 20,000 members, took this step in a program of active cooperation in the nation-wide effort to assure jobs for discharged servicemen and released war workers after the end of hostilities. Activities of the new unit will be directed from a central office located at 330 West 42 St., New York.

Suggested Changes Indicate Re-write of Road Bill

The many suggested changes in the proposed $3-billion post-war federal-aid highway bills, presented during the first four weeks of hearings, before the House Roads Committee, as well as the attitude of Committee members indicate that an entirely new substitute bill may be reported out for consideration by the Congress. The original measures (H.R. 2426 and S. 971) would authorize $1-billion annually for each of the three years immediately following the close of the war to be matched by the states on the basis 75 per cent federal funds—25 per cent state funds. Federal funds would be distributed to give the more populous states some financial advantage in urban traffic problems.

Disagreement with the formula has produced several substitutes and some

It's easier to lift, lower, push or pull the Simplex Way!
Simplex
LEVER · SCREW · HYDRAULIC
Jacks
for every construction purpose
Awarded the Gold Medal for Safety
Ask for Catalog 44
Templeton, Kenly & Co., Chicago 44, Ill.

HIGHWAY CONTRACTORS ANNUAL CAPACITY[1]

(As estimated principally from State Highway Departments' Prequalification Ratings)

(Prepared by the Associated General Contractors of America, Inc.)

PROGRAM UNDER H.R. 2426

State	Federal Funds Only	Total Contract Construction Program[2]	Estimated Capacity of Contractors[3]
California .....(79)....	$ 43,512,000	$ 52,300,000	$212,000,000*
Colorado .....(78)....	15,862,000	19,200,000	39,800,000*
Idaho .....(80)....	10,510,000	12,500,000	15,000,000
Illinois	44,909,000	57,000,000	88,360,000*
Indiana	24,834,000	31,400,000	57,423,000*
Kansas	22,726,000	28,700,000	40,025,000*
Kentucky	19,606,000	24,900,000	40,825,000
Michigan	33,033,000	42,000,000	79,000,000
Minnesota	25,917,000	32,700,000	48,000,000
Mississippi	17,763,000	21,500,000	47,400,000*
Missouri	29,766,000	37,600,000	70,000,000
Montana .....(78)....	16,588,000	20,200,000	20,000,000
Nebraska	17,771,000	22,400,000	37,750,000
New Jersey	17,481,000	22,100,000	41,800,000*
Ohio	39,789,000	50,500,000	130,900,000*
Oklahoma .....(76)....	21,765,000	27,200,000	55,000,000*
Oregon .....(81)....	14,741,000	18,600,000	25,965,000*
South Carolina	13,909,000	17,600,000	39,150,000*
Texas	60,530,000	77,500,000	185,000,000*
Utah .....(77)....	9,667,000	11,900,000	55,000,000
Washington .....(77)....	15,404,000	19,000,000	85,000,000*
West Virginia	11,960,000	15,200,000	32,000,000*
Wisconsin	24,274,000	31,700,000	39,362,000*
Wyoming .....(82)....	10,044,000	11,600,000	77,500,000*
TOTALS	$562,361,000	$705,300,000	$1,562,260,000

[1]Estimates regarding the annual capacity of highway contractors to carry on postwar highway work were presented by The Associated General Contractors of America, Inc., in testimony before the Roads Committee of the U. S. House of Representatives with reference to H.R. 2426, a highway bill proposing a federal appropriation of $3,000,000,000 for the first three years after the war for highway construction.

[2]Includes Federal funds for one year under deduction of 5% for rights-of-way expenditures. The division of cost is 75-25, Federal-State, except in public and states where the law permits the increased Federal participation indicated in parenthesis after these states.

[3]Authority for figures in each instance in hands of the Associated General Contractors of America, Inc.

*Figures supplied by state highway departments.

In the 24 states noted above the ratio of capacity to corresponding contract program is 222%.

On the assumption that the same ratio (222%) obtains in all states for the total program, the results are as follows:

All States $1,000,000,000 $1,250,000,000 $2,775,000,000

On the basis of State Highway Department Prequalification ratings only in the 16 states marked with the asterisk ratio of capacity to contract program is 239%. The actual figures are:

All States .....$ 399,503,000 $ 501,100,000 $1,196,685,000

Assuming that the same ratio obtains in all states for the total program:

All States $1,000,000,000 $1,250,000,000 $2,987,500,000

On the basis of data taken from reports by individual contractors in reply to an inquiry of January 11, 1944, by the A.G.C., the ratio of capacity to the contract program is 180%:

All States $1,000,000,000 $1,250,000,000 $2,244,000,000

The average ratio of capacity to annual program for all three methods above is 217%, with a corresponding total capacity of $2,715,000,000.

Before the smoke of Battle clears away

They Used to Cut Grain by Hand

Then came the harvesting machine. One man and a reaper versus scores of men with scythes. Mevac metered vacuum power control of all operations in the Clipper's work relieves operators from pushing and pulling on operating levers all day long.

—Enter the Buckeye Clipper

A Buckeye Clipper convertible shovel is shown cleaning up debris in war-torn Naples, after a bombardment. Hundreds of these sturdy, easy-to-operate, Mevac-controlled ¾ yd. shovels are being used by the engineers; and their most recent jobs are right on the heels of the infantry, filling bomb craters, toppling standing walls of shell-gutted buildings, and loading trucks with debris.

Buckeyes are mighty popular in the army because of their ease and simplicity of operation for vacuum power control transforms a rookie operator into a veteran "runner" almost overnight.

You can count on the same sterling performance after the war when ½ and ¾ yd. Clippers, no longer in olive drab, are available to you. Send for Bulletin 543 for complete details on Clipper convertible shovels.

Buckeye Traction Ditcher Co.
Findlay, Ohio

Built by Buckeye

Convertible Shovels Road Wideners Trenchers
Spreaders R-B Power Finegraders Tractor Equipment

Committee members have indicated that they may be considering one post-war highway authorization for rural roads on the basis of the traditional federal-aid formula with an additional allocation for urban highways to be distributed more in accordance with population.

Although many states have reported that they would be unable to provide more than 25 per cent of the cost of the proposed program, opposition has developed to increasing the federal percentage of highway expenditures. Some Committee members have stated that they consider the states now in better condition to finance needed highway projects than the Federal Government which has been forced to assume the huge war debt. Opposition also has appeared to proposals for Federal participation in the cost of rights-of-way and off-street parking facilities as well as recommended federal authority in land condemnation.

Complete agreement on the need for early enactment of post-war federal-aid highway legislation is evident but divergence of opinion on major provisions of H.R. 2426 and S. 971 forecast many changes before the proposals become law.

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Smooth, non-grabbing action that adds miles to tire life.
Balanced holding power for positive stopping under all conditions.
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Long wear life with fewer adjustments to keep 'em on the road.
Prolonged drum life to save maintenance time and cost.

These are some of the reasons why GATKE *CUSTOM-BILT* Brake Blocks and Liners make a world of difference in meeting today's tough maintenance requirements.

Ask your GATKE Jobber or write for details.

GATKE CORPORATION
232 N. La Salle St. Chicago 1, Ill.
BRAKE BLOCK DIVISION

Mesabi Iron Range Stripping Up 37 Per Cent

The Mesabi iron range of Minnesota in 1943 spiralled its stripping yardage in open pit iron mine development into a 37% increase over 1942. The total stripping from the entire Mesabi range in 1943 was 44,655,435 cubic yards, which is comparable to some of the big years when the Mesabi range open pit mining was at its height. The past year's mine stripping was the largest in many years. The stripping yardage curve went up to follow the all-time recent record years in iron ore shipping from the Mesabi iron range. The Mesabi was the only source for quickly expanded production of iron ore available to the increased war effort.

Markwell Assistant Head of Reclamation Bureau

Secretary of the Interior Harold L. Ickes announced the appointment of Kenneth Markwell as an Assistant Commissioner of the Bureau of Reclamation. Markwell joins the staff of Commissioner Harry W. Bashore, with whom William E. Warne is serving and will continue to serve as Assistant Commissioner under an appointment by the Secretary in August, 1943.

New York State Takes Over Cost of Rights-of-way

Terming the measure "the fruit of many years of struggle to obtain a modern system of highways" in New York State, Gov. Thomas E. Dewey signed bills transferring from counties to the state the cost of acquiring rights-of-way for state highways; providing for state payment of plans for postwar construction of city arterial highways, and providing that the Legislature may appropriate funds in the future for construction and maintenance of city arterial highways.

Missouri River Study Engineer Group Named

Completion of the appointment of an engineering subcommittee of the Missouri River States Committee was announced April 4 at Pierre, S. D.

Consisting of engineers named by governors of Missouri river states, the subcommittee has been authorized to determine the available water supply in the Missouri basin, the probable amount of water needed in the development program and the location of levees and other installations.

Findings of the subcommittee will be reported by June 1, it was announced at the office of South Dakota Gov. M. Q. Sharpe, committee chairman.

Named to the subcommittee were City Engineer L. A. Winter of Sioux City, Ia.; Montana State Engineer Fred

Answers to Everyday Questions about PREformed WIRE ROPE

1 ***Is PREformed a lay of rope?***

2 ***Is PREformed a special construction?***

3 ***Just what does PREformed mean?***

4 ***How shall I mark my orders to get PREformed?***

These are questions wire rope users are asking. Here are answers to everyday questions we receive.

First, let us be reminded that there are two kinds of rope. One is non-preformed wire rope, the kind that has served users for many years. Then there is PREformed, the kind which is newer, better, and longer lasting. Because it is a newer type rope, because it does a much better job for users, there are many questions asked about it. Let's consider a few.

FIRST . . . *"Is PREformed a lay of rope?"*

No. PREformed does not refer to a lay of rope. Lay refers to the twist or helical form which is characteristic of *all* wire rope. A rope may be Lang Lay, Right Lay, Left Lay, Reverse Lay . . . and each of these lays may be made either PREformed or non-preformed.

Lang Lay ropes should always be PREformed to counteract the tendency towards twisting, because wires and strands are both laid in the same direction in Lang Lay ropes. Further information on Rope Lay is given in the new Macwhyte Wire Rope Catalog, G-15.

SECOND . . . *"Is PREformed a special construction?"*

No, PREformed is not a special construction. Construction refers to the number and arrangement of wires in the rope . . . such as 6 x 17 (six strands of 17 wires each), 8 x 19 (eight strands of nineteen wires each), and so on. These constructions can refer to either PREformed or non-preformed wire rope. (For complete data on constructions, see Catalog G-15.)

THIRD . . . *"Just what is PREformed?"*

Macwhyte PREformed wire rope is the proper size, grade and construction you need, *PLUS*. This *plus* refers to the PREforming, a process which forms the wires and strands into a spiral, so that wires and strands lie naturally in place with a minimum of internal stress.

Illustration above tells the story. Notice how the wire has a special shape? It has been PREformed. When the rope is closed (put together in the closing machine), both wires and strands naturally fall into position in the rope.

Illustration above points to the end of a PREformed rope showing how wires lie naturally in place even though no seizing is there to hold them.

The result is a wire rope that is more flexible and that more quickly adapts itself to the equipment on which it is used. Thus, literally, PREforming means better PER-forming on the job.

A PREformed rope is safer to handle, too, because broken wires (which will happen after *long* usage) do not wicker out as in non-preformed wire rope.

FOURTH . . . *"How should I mark my orders to get PREformed?"*

Just add the words "Macwhyte PREformed" to your specifications. Like this, for example:

1,250 feet 1" 6 x 19 Lang Lay with IWRC, Macwhyte PREformed Monarch Whyte Strand wire rope.

If you leave out "Macwhyte PREformed," the specification then becomes a non-preformed wire rope specification. The reason? When PREformed is not mentioned on the order, it is a standard practice to supply non-preformed.

FIFTH . . . *Internal Lubrication, too!*

And a bonus *Plus* feature of Macwhyte PREformed wire ropes is *internal lubrication*. Not only are wires and strands PREformed, but each wire in the strands is coated with an elastic, non-drying film of lubricant, as explained on pages 10 and 11 of G-15 catalog.

We have been making wire rope for equipment like yours for many, many years. The benefit of that experience is yours for the asking. You can be assured, too, that when you select Macwhyte you are not only getting "the correct rope for your equipment," but also a personal interest in helping you get the *most* out of *your* rope.

MACWHYTE PREformed WIRE ROPE — Plus Internal Lubrication Selected Steels Tested-Proved

The correct rope for your equipment

NO. 741

MACWHYTE COMPANY

Wire Rope Manufacturers

ARMY E NAVY

1903 FOURTEENTH AVENUE KENOSHA, WISCONSIN

Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle • San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and Internally Lubricated Wire Rope — MONARCH WHYTE STRAND Wire Rope — MACWHYTE Special Traction Elevator Rope — MACWHYTE Braided Wire Rope Slings — MACWHYTE Aircraft Cables and Tie-Rods — MACWHYTE Stainless Steel Wire Rope — MACWHYTE Monel Metal Wire Rope

• Largest dragline ever made by Bucyrus-Erie, stripping on the property of the National Portland Cement Company of Brazil near Rio de Janeiro. The dragline has a 12-cu. yd. bucket and a 250-foot steel and aluminum boom.

E. Buck, South Dakota State Engineer D. W. Loucks, George S. Knapp, chief engineer of the division of water resources, Kansas State Board of Agriculture; Nebraska State Engineer Wardner G. Scott, Wyoming State Engineer L. C. Bishop, R. E. Duffy, chief engineer of the Missouri Public Service Commission; acting North Dakota State Engineer J. J. Walsh, and C. L. Patterson, chief engineer of the Colorado Water Conservation Board.

Engineer Unit Solves Water Supply Problem in England

The U. S. Army Engineers, England —Army Engineers in England face many problems in arranging adequate supplies of fresh water for camp sites. One engineer general service regiment recently found more than its usual share of troubles when it was assigned the task of erecting one of the largest water tanks in the European theater of operations.

The location specified for this huge tank of 80,000-imperial-gallon capacity permitted easy access from only one side. The other three sides were hemmed in by an administration hut, a civilian cabbage patch, and a road. On the road, directly opposite the spot selected for the tank, was a telephone pole. Since the steel framework for the tank's base was to extend 60 feet into the air, the crane had to employ a much larger boom than was customary. Thus, it appeared for a time that it might be necessary to take down one pole, to enable the heavy steel girders, some of which weighed two tons, to be raised to the proper height in the correct position.

This would have meant blocking the narrow road with the crane for the construction period. Such a step would have required costly detours for both military and essential civilian traffic. For this reason it was decided to operate the crane from the one side of the site. While it would be much more difficult to set all the steel beams in place working from one side only, the road would remain open.

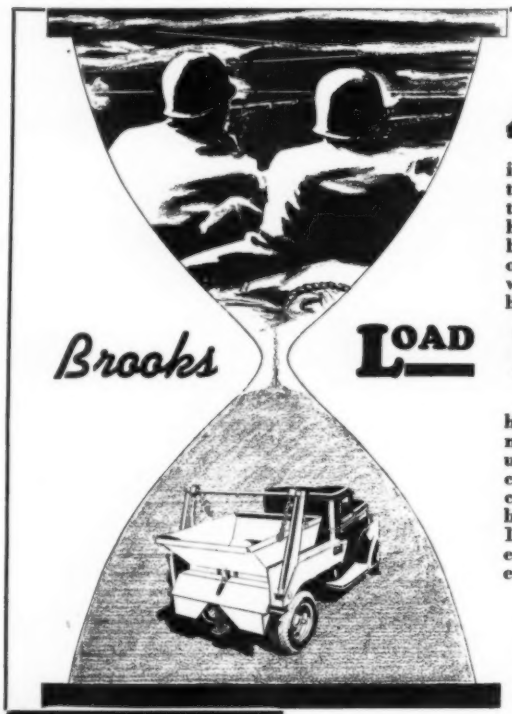
The crane itself was equipped with a 50-foot boom. This was too short for the work that had to be done, and it was extended 15 feet. Even at that, it was found necessary to attach a 15-foot jib boom for some of the operations. It is believed that this built-up boom is the longest ever used by American Army Engineers in Great Britain. "I'm having no trouble at all with the crane," said Sergeant John Maione of New York City, who is the crane operator. "This baby can do almost anything I ask except sing 'White Christmas'."

The crane to which Sergeant Maione referred is equipped with a diesel engine. Sergeant Maione has been using it for three months, and has never had any mechanical difficulty. Preliminary figuring showed that, even with the unusually large boom, the crane would be a little short for major effectiveness. It was decided to fill in the ground upon which the crane would stand several feet.

Then the excavation work began. This was to prepare the site for the pouring of the concrete piers. Because of the weight and size of the tank and frame-work, six of these, 8-feet square and 6-feet deep, were needed. These had to be solidly constructed, for they would be called upon to bear a total of 1,000,000 pounds when the tank was filled with water. Many 40-foot steel beams were to go into the framework.

The steel crew of ten men is now setting up the tank itself. Into its construction will go more than 800 cast iron plates, each of which weighs nearly 100 pounds. More than 6,000 sets of bolts and washers will be used. "Almost all the crew is entirely Army-trained in this type of work," said Sergeant Stewart W. Henry of Newburgh, New York, who is in charge of the steel work. "Still, in spite of their lack of experience, they're doing as well as a veteran crew could, or better. We'll have the tank full of water before schedule."

It had been estimated that 10,000 man-hours would be needed for the building of this tank. American engineer officers, weighing the quality of their men and equipment, set the figure at 2,500 man-hours. At the current rate of progress, even this low estimate will be pared considerably. "The men on this job deserve a lot of credit," said 1st Lt. Walter S. Burk, Jr., of Washington, D. C., who is supervising the project. "They have had unexpected



Time is vital . . .

in the front lines and in the production lines. Materials and supplies can be handled faster and easier by using LOAD LUGGERS on your trucks for all jobs where loading is done by hand labor.

Brooks LOAD LUGGER

helps to speed the movement of quarried products, excavated material, crushed rock, sand, gravel, cement, fuel and other bulk materials. Use 5 to 10 dump buckets with each unit for maximum economy.

Write for Catalog No. 44 . . . and ask about the TrucKrane Boom Attachment for the Load Lugger.

305 Davenport Rd., Knoxville, Tenn.
Distributors in all Principal Cities

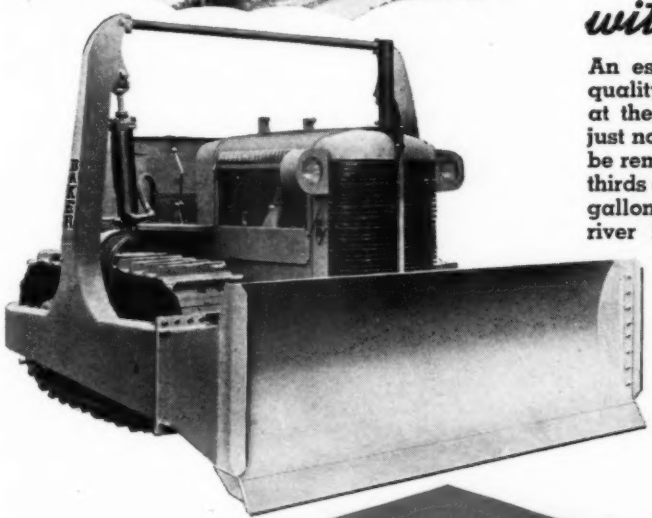
Brooks EQUIPMENT AND MFG. CO.

Opening a Lake Bottom Iron Mine

Baker *Hydraulic* Gradebuilder on an Allis-Chalmers tractor skidding a scow over a Baker-built road, from the railroad to the "under-lake" mining project. C. A. Pitts, Ltd., Toronto, Ont. are general contractors.

...with Baker Bulldozers!

An estimated 30 million tons of much-needed, good quality Bessemer hematite iron ore, in three lodes, lie at the bottom of Steep Rock Lake, Ontario, Canada, just north of the Minnesota border. Five-sixths of it can be removed by open pit mining. To get at the ore, two-thirds of the lake must be drained, involving 125 million gallons of water, and the other third dammed off. A river flowing through the lake must be re-routed making use, where possible, of adjacent lakes and existing streams. This will necessitate numerous dams, earth fill dikes, excavation of channels, clearing of land and the building of many roads, each from 3 to 15 miles long. Finally, right-of-way must be built for trackage from the mine to a railroad 3 miles away.



Baker *Hydraulic* Bulldozers and Gradebuilders are made in 12 models.

Logically, a number of Baker *Hydraulic* Bulldozers and Gradebuilders are being used to rush this job to completion. Operations were started in the spring of 1943. Baker's capacity for getting vast quantities of dirt moved faster—its ability to 'doze trees, logs and boulders and to pile, spread, level and compact, make it tailor-made for this job.

Bakers are earning "Distinguished Earth-moving Crosses" on scores of war jobs, piling up performance records that deserve your attention when you buy post-war equipment!

THE BAKER MFG. CO.

504 Stanford Ave. Springfield, Ill.

"If It Concerns Victory, It Concerns Us!"

BULLDOZERS SNOW PLOWS **BAKER** CONSTRUCTION EQUIPMENT

problems and bad weather to contend with, but are not permitting anything to delay the work. They know the importance of a good water supply."

• Cedarapids master tandem plant owned and operated by Haefy-Moore and Frederickson & Watson furnishing aggregate for the Santa Maria Air Base in California.

Allied Tractor Equipment Industry Committee Meets

The production outlook for the remainder of 1944, recent changes in Order L-192 (construction machinery) and the scheduling of components were the chief topics discussed at a March meeting of the Allied Tractor Equipment Industry Advisory Committee.

With some exceptions, production during the remainder of 1944 is expected to be sufficient to meet the most essential requirements, Construction Machinery Division officials told the Committee. Over-all production capacity for 'dozers, power control units, scrapers and rippers is adequate. Delivery schedule on arches, winches and crawler wagons are being maintained, but shipments of crawler wheel assemblies are somewhat delayed.

Orders L-192 and L-196 were reviewed in detail. WPB officials emphasized that the provisions of L-196 requiring WPB authorization for the sale of used shovels, cranes, drag-lines, motor graders and track-laying tractors is designed to make certain that the limited number of these items available for sale will be put to the most essential uses. The provision is in no sense a "freeze" on sales.

Automotive type components are still critical, despite easement in the over-all supplies of controlled materials. The industry has been asked to report its requirements for these components so that their production may be properly scheduled. The flow of all components, WPB officials pointed out, is determined by the production capacity of the scarcest component.

Lt. Col. Garbisch New District Engineer for N. Y.

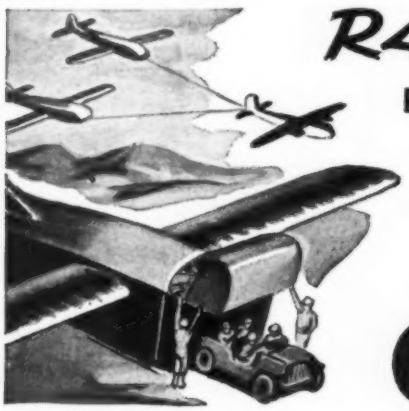
Lt. Col. Edgar W. Garbisch, Corps of Engineers, whose abilities have won recognition in the business and sports worlds as well as in the Army, is the new District Engineer for the New York District. From his headquarters at 120 Wall St., he directs all aspects of the Engineers' military supply, military construction and river and harbor and flood control programs in the District which includes metropolitan New York and Long Island, most of eastern New York State, northern New Jersey and western Vermont.

Colonel Garbisch graduated from Washington and Jefferson College and the U. S. Military Academy at West Point, N. Y., where he gained national recognition as an All-American football player. He returned to active duty shortly after the war began and has held a series of responsible posts with the Corps of Engineers. He returns to New York after a tour of duty as District Engineer at Providence, R. I. Prior to that assignment he had served as executive officer to Col. A. B. Jones, his predecessor in the New York District.

In addition to his usual duties in carrying out river and harbor maintenance and improvements and flood control projects, the District Engineer, as a result of the war, has been made responsible for all construction work at military installations in the district and for successful prosecution of a supply program to furnish Engineer materials and equipment to troops in the field.

Colonel Garbisch has held executive posts in the sales and advertising fields and has served as an officer and director of several large corporations in New York and elsewhere.

Lt. Colonel Garbisch served for a time at Ft. Humphreys, Va., now Ft. Belvoir, before resigning to begin a business career. Characteristically, he chose to start at the bottom, working as a laborer for a food company, but he rose steadily to positions of responsibility and was one of the three sales managers of the company before leaving the business for other ventures.



RAPID DUMPING
FOR HI-SPEED

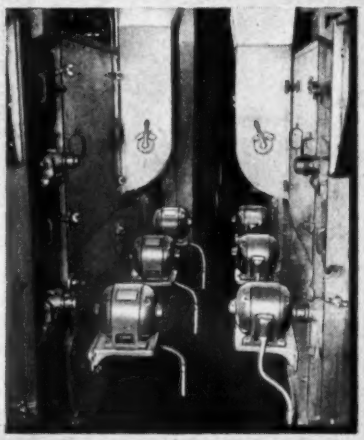
In digging and material handling, too, rapid discharge of the load is an essential feature. Every Owen Bucket is designed to incorporate rapid discharge operation — a factor responsible for their outstanding performance.

THE OWEN BUCKET CO.
6095 BREAKWATER AVE., CLEVELAND, O.
BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.

OWEN BUCKETS
A MOUTHFUL AT EVERY BITE

WHEN THE HEAT'S ON

Motor-driven machinery is often called upon to operate under conditions of extreme heat and humidity. For example, the motors on this wool-plant washer must operate in an air temperature of 100° F., with humidity higher than 80 per cent. Conditions like this would shorten the life of any motor lacking effective, performance-tested ventilation design. The double-end cooling system of the Tri-Clad motor helps offset the effects of high ambient temperatures common to heaters, dryers, and many ventilating-fan applications. In addition, motor windings of Formex wire (Class A insulation) are unusually long-lived under total temperatures (ambient plus rise) up to 194 F. For even higher temperatures, Class B insulation offers still greater protection.



G-E Tri-Clad motors applied to Sargent back washers at plant of the Southwell Wool Combing Company, No. Chelmsford, Mass.

Multi-Point Tests on TRI CLAD Motors Tell Temperature Conditions Inside and Out

Dozens of thermo-couples and thermometers at all vital points of this Tri-Clad motor reveal temperatures under a wide range of load conditions. First, tests like this helped to perfect the double-end ventilation design. Now regular tests of Tri-Clad motors taken off the production line verify previously established temperature-rise limits, and ability of insulation to stand up. Continued research along the same lines, including operation in enclosures which restrict air flow, points the way to further improvements in the future. ***General Electric Company, Schenectady 5, N. Y.***

GENERAL ELECTRIC

Every week 192,000 G-E employees purchase more than a million dollars' worth of War Bonds.

TRI CLAD MOTORS

• U. S. Army Engineers use this Caterpillar tractor and LaPlant-Choate bullgrader to clear debris of a shell-torn masonry wall in Italy.

U. S. Signal Corps Photo.

Shortly after the present conflict began, he re-entered the service, again as an officer in the Engineers Corps, to which he had been assigned when he left West Point.

Allow Use of Alloy Steels in Dozer Manufacture

Restrictions on the use of alloy steel in scrapers, angledozers or trailbuilders, and bulldozers were removed by the War Production Board. Action was taken by revocation of Schedules I, III, and IV of the construction machinery and equipment simplification and conservation order (L-217). Simultaneously, WPB removed restrictions on the use of metal for specified parts of truck mixer-agitators through an amendment to Schedule VI of the order.

This action is in line with WPB policy of permitting a return to materials normally used if the supply situation warrants the change, if no additional labor will be required, and if the change will result in a better product.

Schedule I, covering scrapers, was issued simultaneously with Order L-217 in November, 1942; Schedule III, covering angledozers or trailbuilders, and Schedule IV, covering bulldozers, were issued in January, 1943. These three schedules prohibited the use of alloy steel in manufacture.

Schedule VI, covering truck mixer-agitators, was issued in February, 1943. It limited manufacture to specified sizes and types and also prohibited the use of metal in running board platforms or drum guards except for supporting brackets. The schedule as amended today deletes the prohibition on the use of metal in these parts. Limitations on sizes and types, however, remain unchanged.

Study Wider Utilization of Anthracite Fines

A wider utilization of anthracite "fines" to reduce an annual surplus of a million tons of this kind of fuel and to relieve shortages in other fuels is being investigated by Bureau of Mines engineers.

The investigations and experiments, being made at the request of the Office of Solid Fuels Administration for War, will explore the possibilities of using more anthracite fines—No. 3 size and smaller—to mix with bituminous coal in briquettes, to replace low-volatile coal in byproduct coke ovens, and in gas producers which normally use larger sizes of anthracite.

A program to effect a material reduction in the national stockpile of anthracite fines was begun recently by the Solid Fuels Administration after the Bureau of Mines conducted tests showing that mixtures of anthracite "barley" and bituminous slack coal will burn in underfeed stocker equipment with about the same efficiency as straight bituminous coal.

Demands for this type of fuel in army camps and private plants are increasing, but additional consumption is necessary under the war program. Anthracite fines are described as a slow-moving fuel, and the piling up of supplies delays the production of larger sizes of anthracite needed for domestic heating purposes.

Outlining the investigations that the Bureau will undertake, Dr. R. R. Sayers, Director of the Bureau, advised Secretary of Interior Harold Ickes that engineers will consider whether an increase in the quantity of anthracite used in the briquetting industry is feasible, and whether idle and new type equipment can be put into operation. A suggestion that some building brick-making equipment, not in use at

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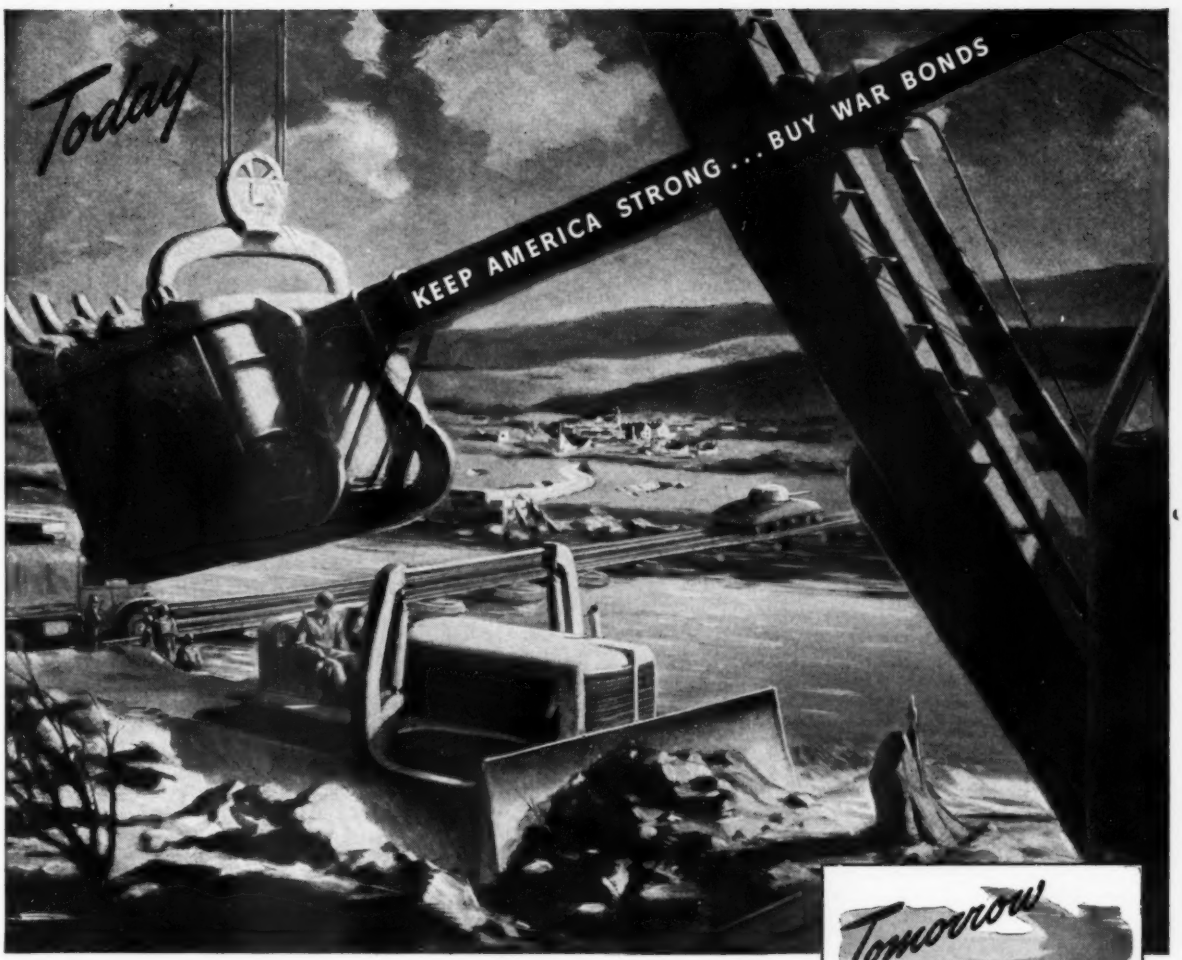
LINN
CONTOUR-FOLLOWING TRACTION
are carrying loads in all climes where off-the-highway operation is required.
• Ruggedly constructed and amply powered for the toughest going.
• From 5 to 20 tons capacity.
THE LINN MANUFACTURING CORPORATION
MORRIS, NEW YORK



POWER TO WAGE WAR AND TO SERVE PEACE

FROM the very beginning, GM Diesels have been tested in the crucible of war. They power tanks, heavy gun tractors and bulldozers; submarines and subchasers; invasion boats and lighters. And everywhere, always, these weapons are proving worthy of the fine fighting men who are using them.

That is because GM Diesel operation is based on simple and sound mechanical principles. GM Diesel construction is exceptionally strong and uniformly precise—the way General Motors always builds.

When normal life and living are resumed, GM Diesels will be as ready to step back into private life and resume service in peace as they were to go to war. And you will find them as capable of sure, reliable, low-cost performance on the toughest jobs at home as they are on fighting fronts the world over.

America's farms are going to need GM Diesel power for their tractors. This sure, reliable, low-cost source of power will go far toward solving some of the farmer's most vexing problems. And not the least of these problems is to get more work done, faster and at lower cost in labor and mechanical power. GM Diesels will help.

GM
GENERAL MOTORS
DIESEL POWER

ENGINES...15 to 250 H.P... **DETROIT DIESEL ENGINE DIVISION,** Detroit, Mich.

ENGINES...150 to 2000 H.P.....CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

LOCOMOTIVES.....ELECTRO-MOTIVE DIVISION, La Grange, Ill.

certain seasons, can be employed in pressing fuel briquettes, also will be investigated.

Experiments will be made with gas producers, Dr. Sayers added, to ascertain whether the installation of a mechanical agitator in the fuel bed will permit the burning of smaller sizes of anthracite than now being used, and at the same time maintain the same capacity.

In the coke-oven field, the Bureau plans to extend research conducted by private industry in the substitution of anthracite fines for part of the low-volatile bituminous needed, since a continuing serious shortage, particularly of central Pennsylvania low-volatile coal, has been predicted.

New York Highway Fund Diversion Amendment

A proposed New York State constitutional amendment to curb highway fund diversion died in committee during the now-adjourned 1944 state legislative session at Albany. The proposal would have applied only to receipts from the state's regular 2-cent gasoline tax and not to two 1-cent emergency levies on gasoline.

Remove Restrictions on Use of Iron and Steel

To improve the quality and performance of conveying machinery and power transmission equipment and reduce the manhours of production time, the War Poduction Board removed restrictions on the use of iron and steel in bunkers, conveyor structures and other items. Restrictions were also lifted on the use of alloy steels for chain and sprockets. This action is covered by an amendment to Limitation Order L-193.

Ask Prospectors to Watch for Mica Deposits

An appeal to prospectors, amateur and professional, to be on the lookout for deposits of mica was included in a memorandum sent to grazing service offices from the office of the director of grazing at Salt Lake City, Utah in cooperation with the War Production Board.

Mica is a valuable war material needed for military radio and electrical equipment. The WPB announces that a bonus of $1 a pound will be paid in addition to the prevailing market price of $5 a pound for top grade mica.

It is thought that it is possible that there are some mica deposits in the west that have so far escaped attention of the government. Persons having mica deposits which indicate they will develop into potential producers, may receive aid by having a road constructed to the property through the government access mine road program.

Mica, with the correct dialectric properties that can split into sects approximately two inches square or larger, is scarce in the United States.

Silver Consumption 118 Million Ounces in 1943

Consumption of silver in 1943 totalled 118 million ounces, according to figures submitted at a recent Silver Producers and Distributors Industry Advisory Committee meeting, the War Production Board announced. Domestic production totalled 40 million ounces.

A general review of the silver supply-demand situation for 1943 was presented by WPB officials. The Committee heard estimates of anticipated domestic silver production and imports of ore and base bullion and refined silver for 1944.

The net consumption of silver in industry for 1943 was reported to have totalled 118 million ounces, some 71 million ounces of which were accounted for by essential industry. Imports of ore and base bullion and refined silver totalled approximately 63 million ounces as compared with 108 million ounces in 1942. United States mine production totalled approximately 40 million ounces. Gross requirements exceeded net consumption by a considerable margin. The deficiency between new supply and requirements was supplied from Treasury "free" silver. All such silver released went to essential industry.

Producers estimated that domestic

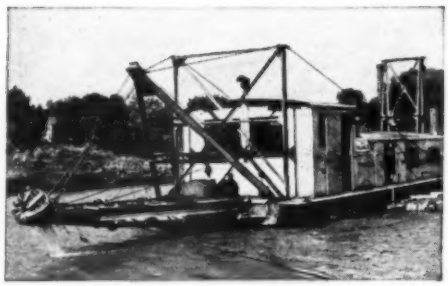
ASD DREDGING EQUIPMENT

HYDRAULIC - DIPPER - CLAMSHELL

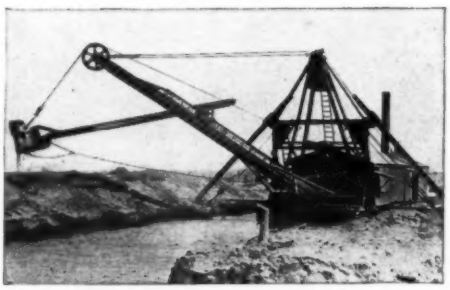
Complete integrated units, each designed for specific performance.

Bolted sectional steel hulls, power and pumping units, spuds, frames, ladder or booms are shipped by truck, rail and/or as hold cargo. May be easily assembled at inland site and dismantled for relocation after project is finished.

ASD dredges are backed by 40 years of dredge engineering and operating experience.



HYDRAULIC DREDGES
Sizes 8 inches up



DIPPER and CLAMSHELL
¾ cu. yd. up

We invite inquiries now for post-war delivery.

Write for catalog, photos and data sheets.

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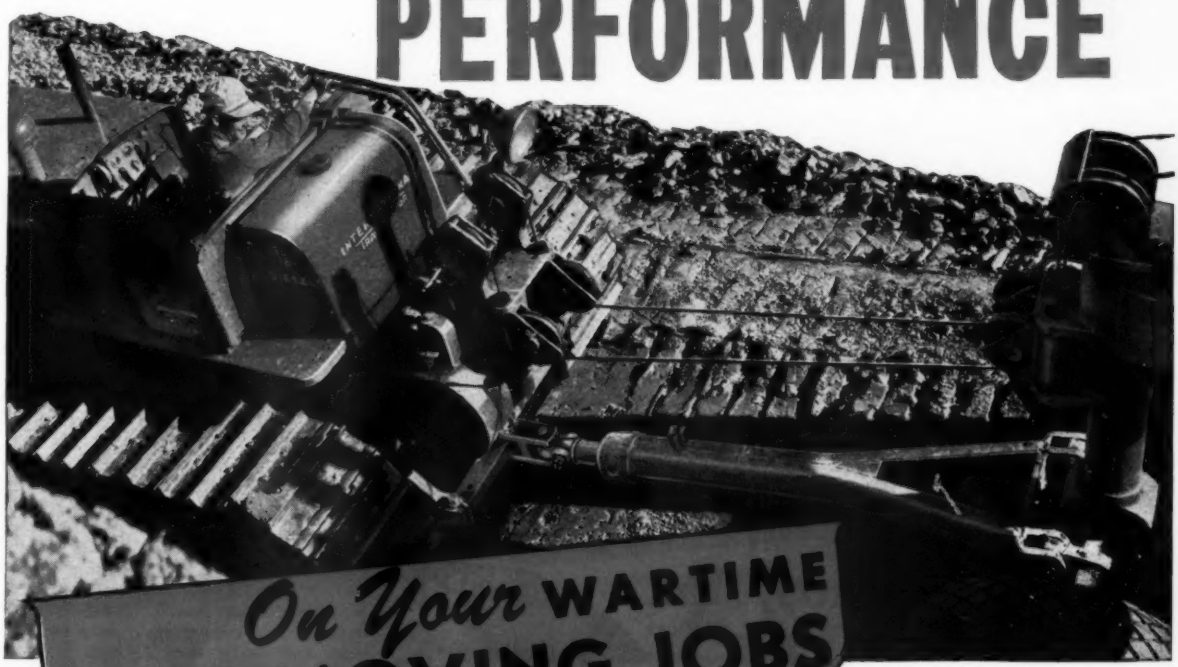
How To Get TOP WINCH PERFORMANCE



On Your WARTIME DIRT-MOVING JOBS

The best tractor, the best tractor equipment can't move dirt efficiently if winch trouble piles up lost time. Nor will the best winch stand up under the punishment of high-speed 3-shift wartime service if maintenance is neglected. Bucyrus-Erie Power Control Units are built for long life and hard usage. Here are a few hints on their proper care:

1. Clutch bands receive more wear than the brake bands. Interchange them occasionally to obtain maximum life from the linings.
2. Check the adjustment of clutch and brake bands daily. Keep linings clean.
3. Disassemble sheaves and clean them occasionally to prolong life of the bearings and other parts.
4. Check the oil level in the gear case often, keep it clean and free from dirt and cuttings.
5. If oil seals are leaking, try to tighten them by cutting and shortening the springs inside the seals.
6. Lubricate regularly using good grade lubricants and follow the manufacturer's instructions carefully.

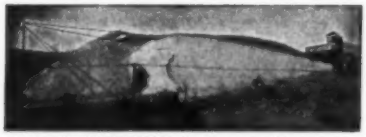
Keep your tractor equipment producing . . . your nearest International TracTracTor Distributor will be glad to advise you on proper maintenance and lubrication.

P-139-C

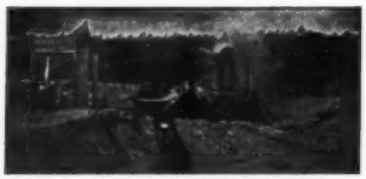
BUCYRUS ERIE
TRACTOR EQUIPMENT

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR

DIGGING AND STOCKPILING SIMPLIFIED



A simple SAUERMAN Scraper machine stores and reclaims a seasonal surplus of 30,000 tons of screenings at crushing plant.



Here's another small SAUERMAN Scraper that moves sand from hill to asphalt plant at cost of 4 cents per cubic yard.

This shows a typical SAUERMAN Scraper layout for storing and reclaiming large tonnage of coal, or any bulk material.

With a Sauerman Power Drag Scraper

MANY excavating and stockpiling jobs involving hauls of 100 to 1500 ft. are reduced to their simplest terms by using a SAUERMAN Power Drag Scraper which loads, conveys and places the materials in one operation.

First cost of a SAUERMAN Scraper machine is reasonable, maintenance expense is small and labor is reduced to a minimum.

Moreover this equipment is very flexible and is readily adapted to meet any new and difficult working conditions.

Sizes range from small portable units designed for cheap handling of small hourly tonnages of loose materials up to powerful machines that will scoop up a 15 cu. yd. load and move this big load to any point within the machine's operating radius at a speed of 300 ft. per minute.

Write for Catalog

SAUERMAN BROS, INC.

574 S. CLINTON ST. CHICAGO 7, ILLINOIS

mine production in 1944 would closely approximate that for 1943, although it was stated that manpower problems might reduce this figure. It was estimated that silver imports in the form of ore, bullion and refined silver might total 65 million ounces. However this figure is admittedly tentative. Larger imports of refined silver from Mexico are anticipated soon. It is hoped that some of this silver may be diverted to the Government stockpile for the purpose of meeting any sudden and unpredictable increase in demand. Any additions to stockpile will be moderate and the subject will be reviewed at the next meeting of the Committee. Distributors reported ability to meet current demand for the various forms of silver required by industry and also reported a fair balance of supplies on hand as between foreign and domestic stocks.

There was some discussion of the Treasury Agreement to repurchase Treasury "free" silver left in the inventory of manufacturers eligible to sign the agreement upon cancellation of war contracts and also of portions of the Baruch report related to this.

A number of typical cases of lack of compliance with provisions of Order M-199 and of actions taken to correct these abuses as well as the possible need for minor amendments to Order M-199 were discussed.

Cement Group Ask L-179 be Rescinded by WPB

The Portland Cement Industry Advisory Committee at a recent meeting recommended that Order L-179 be rescinded at some future date and that the industry be given sufficient advance notice that it will be able to dispose of inventories before the Order is withdrawn. Several members of the committee believed that six months' notice should be given, thought there was some variance of opinion on this subject.

Mr. James Taylor, Building Materials Division, WPB, suggested that orderly production would be facilitated if the provisions of the Order relating to manufacture are withdrawn about two months prior to those provisions relating to shipment. Committee members believed that if this suggestion were followed, the industry would be placed on an equitable basis with respect to new production.

Remove Metal Ban on Contractors' Pumps

Certain restrictions on the use of metals in contractors' dewatering and supply pumps were removed by the War Production Board. Wheel bushings may contain copper or copper base alloy; and body construction of self-priming centrifugal pumps may be of iron or aluminum, instead of only iron. Restrictions on skids, which formerly could be made only of wood, have been removed.

These relaxations on the permitted use of metals are made by an amendment to Schedule VII of Order L-217 (Construction Machinery and Equipment Simplification and Conservation).

The Schedule covers four types of gasoline or electric motor driven pumps (skid or trailer mounted) ordinarily used by contractors for dewatering and supply. They are centrifugal self-priming pumps, diaphragm pumps, triplex piston road pumps, and plunger pumps.

All other provisions of the Schedule,

HAYWARD BUCKETS

PLAY SAFE . . .
CHOOSE HAYWARDS

Hayward Buckets won't fall down on the job, cause time out, or require costly repairs.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.

NEED A BIG Trailer?

La Crosse Makes Them Up To 200 Ton Capacity

WRITE OR WIRE

LA CROSSE TRAILER & EQUIPT. CO.
LA CROSSE, WISCONSIN U.S.A.

For better Blasting

IT'S SOMETHING TO REMEMBER — EVERY DAY

Primacord consists of a continuous core of PETN within a flexible textile cover. Primacord is insensitive to fire, friction or ordinary shock, but must be detonated by means of a fuse and cap or electric blasting cap. This detonating wave moves at the rate of 20,350 feet per *second* — practically instantaneously. It acts directly upon every cartridge in the hole, giving to each the added force of a primer cartridge.

Send for the Primacord Book — it shows the way to better (and more profitable) blasting.

PRIMACORD-BICKFORD

Detonating Fuse

Manufacturers of Safety Fuse since 1836

11

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONNECTICUT

• Allis-Chalmers tractor equipped with a Gar Wood bulldozer pulls a supply trailer off an LCM boat at a North African beach.
Official U. S. Navy Photo.

limiting production, sizes and types, painting, and manufacture of accessories, remain unchanged.

Highway By-Pass Opened In Dublin

The Lord Mayor of Dublin, Ireland, recently opened a highway by-pass in that city built at a cost of 43,000 pounds. It has two divided lanes each 22 feet wide.

Plan New Roads Near Jacksonville

The Florida State Road Department has budgeted $3,085,315 for expenditures on 13 post-war highway projects in Duval County. The program is expected to increase greatly in the opening of the post-war period when it is planned to construct several new highway approaches to Jacksonville. Surveys on these are now being made.

Iafarate Credited with Originating C-B Insignia

In the article in the March issue on the Seabees, "Meet Uncle Sam's 'Can Do' Boys," credit for originating the Seabee insignia was given to Walt Disney. Lt. F. G. Thomsen D-V (S) USNR, welfare and recreation officer at the U. S. Naval Construction Training Center at Davisville, R. I., states that this is an error. He explains the correct origination of the insignia as follows:

"Lt. Commander H. M. Shilstone, CEC, USN, saw the need of an insignia and requested Frank Iafarate, CMlc, now assigned to Camp Endicott, Naval Construction Training Center, Davisville, R. I., to submit some sketches to him for approval. A sketch that Iafarate designed was accepted and is now the official Seabee insignia. This insignia was originated about March, 1942, long before Disney came out with any Seabee insignia."

Vice Admiral B. Moreell, CEC, USN, who selected the insignia sent Iafarate the following letter of commendation on March 16, 1942:

"I am pleased to advise you that the insignia for the Construction Battalion, together with the designation of "Seabees," has been approved and authorized. Your clever design of the insignia unquestionably contributed measurably to its approval. It is planned to use the insignia on the Construction Battalion equipment and also in an advertising campaign shortly to be conducted. It is believed that the insignia and the designation of "Seabees" will add much to the esprit de corps of the Construction Battalions.

"Please accept my thanks and those of all the Construction Battalion personnel for your efforts in their behalf."

HI-POWER DIGGING BUCKETS have the lower sheaves *non-pocketed*, and *up and above* the counterweight where they and the closing line are *out of the muck*. For rope economy too, specify HAISS HI-POWER.

Bucket agencies throughout the country. Write, wire for prices, delivery and catalogs.

GEORGE HAISS MANUFACTURING CO., INC., 144th St. & Park Ave., New York 51, N.Y.

OBITUARY

CHARLES L. HARRISON

Charles L. Harrison, 60, associated with several contracting firms, died suddenly in Cape Girardeau, Mo., on March 9.

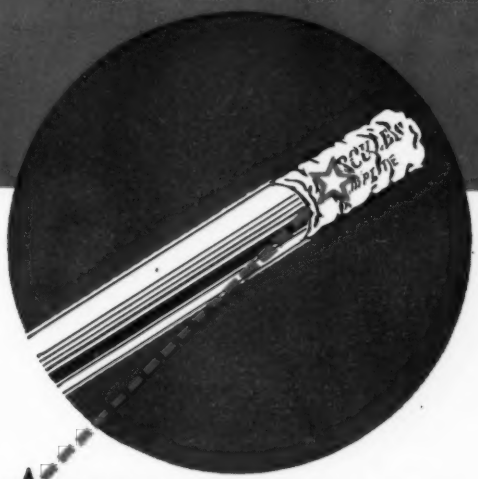
A member of a pioneer Cape Girardeau family, Mr. Harrison helped promote the Mississippi River bridge there and the extension of the Missouri Pacific Railroad into the city. He was financially interested in banks, a hotel and a securities corporation. He also headed the Regenhardt Construction Co. of the Cape, was treasurer of the Lutesville Sand & Gravel Co., vice-president of the Rock Hill Asphalt & Construction Company of Clayton, Mo., vice-president of Builders Supplies, Inc. of University City, Mo., and president of the Kansas City Crushed Stone Co., all subsidiaries of Harrison Securities, a family corporation organized by three brothers after the death of their father, William H. Harrison, in 1921.

Mr. Harrison was formerly a director of the U. S. Chamber of Commerce and past president of the Associated General Contractors of Missouri.

TAMPTITE

SAVES TIME · SAVES LABOR · PACKS SNUGLY · GIVES BETTER BREAKAGE

1 **FASTER LOADING** of bore holes is possible with Tamptite because there is no wasted time splitting cartridges, no fuss or bother. You simply insert a Tamptite cartridge and tamp.



2 **TIGHTER CHARGING** is bound to result because both dynamite and the Tamptite wrapper expand to fill the bore hole tightly, snugly. Virtually no air space remains around the charge.

Order your favorite Hercules explosives in Tamptite cartridges. All the customary grades and sizes of Hercules Gelamites*, Hercomites*, Extra Gelatins, Gelatins, and Extra Dynamites are available in this time-saving wrapper.

3 **BETTER BREAKAGE** of the ore or rock occurs because the entire charge is concentrated exactly where you want it. The result is speedier mucking and a faster mining cycle.

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EXPLOSIVES

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*REG. U. S. PAT. OFF.

XR-42

ORDER HERCULES EXPLOSIVES IN TAMPTITE CARTRIDGES

Equipment

you ought to KNOW ABOUT

Heil Trailbuilder

Manufacturer: The Heil Co., Milwaukee, Wis.

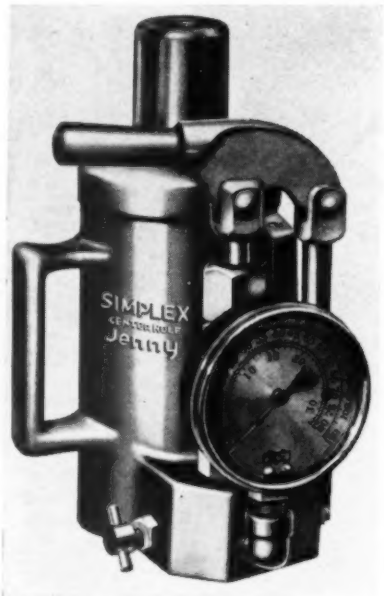
Claims: The action of the blade in the newly designed Heil Trailbuilder is governed by a power control unit that assures the operator smooth, positive action, full visibility, and minimum cable stress. The sturdy side arms hold the blade rigidly in position. The cutting edges are of specially treated alloy steel and they are removable as well as reversible. Adjustable mushroom grading shoes are available as special equipment on either type of blade and are readily replaceable.

Built to work integrally with International's biggest Diesel - powered "cat" tractor, the Heil unit is easily and conveniently mounted. The unit is engineered so that nothing is attached to the motor frame and so there is no severe twist or strain on the tractor at any point.

The blade is tilted by removing the combination connecting and locking pin from the front ends of the extension arms and resetting the moldboard at the desired tilt. End tilt adjustment permits maximum use of the flexibility of the unit.

Angling the blade of the unit merely involves the removal of the pins in the side members of the frame, adjusting the blade to the desired angle, and replacing the pins.

For further details about the equipment on these pages please write to the manufacturer, mentioning Excavating Engineer.

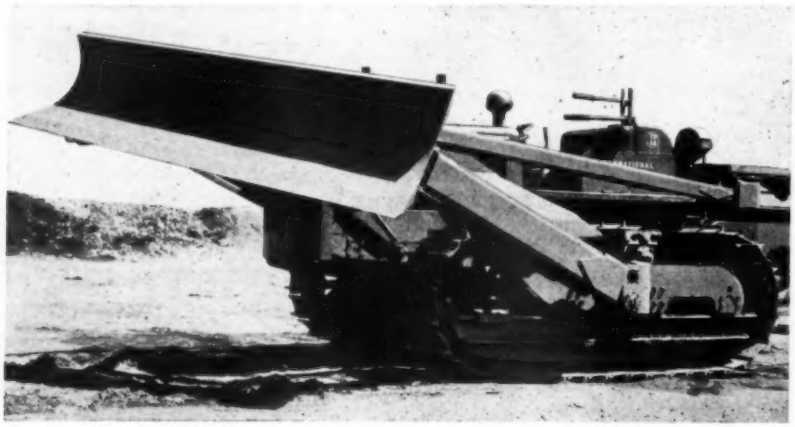


Hydraulic Puller

Manufacturer: Templeton, Kenly & Co., Chicago, Ill.

Claims: The Simplex Jenny Center Hole Hydraulic Puller was designed to accomplish in minutes production, maintenance and repair jobs which normally require hours. It pulls, pushes or lifts, and can also be readily rigged as a portable press. This self-contained unit operates vertically or horizontally without the need for heavy auxiliary equipment, and without side thrust or friction. Applications include pulling bushings, cylinder liners, cutless bearings, pistons, wrist pins, valve seats, keys, wheels, sprockets, gears, boiler tubes and pipes. It is also used to pull structural members together for welding or riveting.

Five models are available, from 30 to 100-tons capacity. Three models have single pumps and two have high and low speed trunks which may be operated separately, alternately, or together.



Paint Brush Cleaner

Manufacturer: Technical Development Laboratories, Tenafly, N. J.

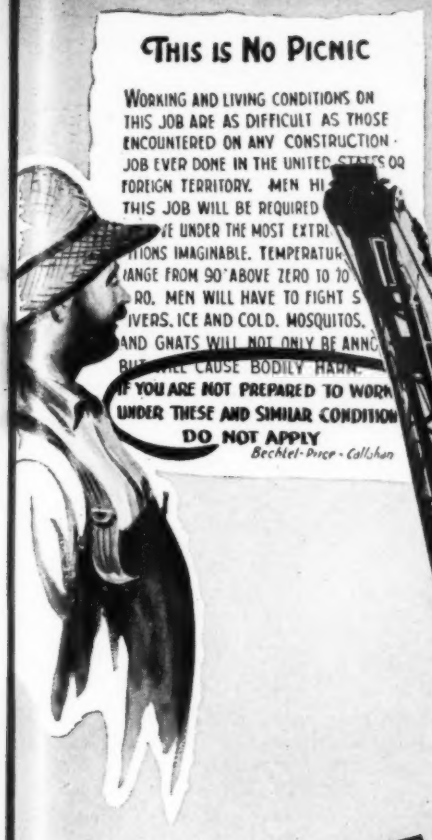
Claims: This paint brush cleaner, known as Prestorer, prolongs lives of brushes now in service and restores to service brushes that have become hard and useless through neglect. Recently used brushes become clean in a few hours when immersed in the solution and old and tough brushes, after long neglect, become clean and usable in from 12 to 96 hours of immersion. Solution contains no high-powered caustic alkalies and it is non-inflammable. The solution is absorbed into the bristles by capillary action, causing the bristles to swell and thus crack off hard paint pigment. After drying, the swelling disappears and the bristle returns to normal size without injury. The pigment is not dissolved in the solution and so can be strained out and the solution may be used over and over again.

Improved Brake Lining

Manufacturer: Gatke Corporation, Chicago 1, Ill.

Claims: Improved moulded brake lining with wire back reinforcement for use with external (band or contracting type) brakes. Known as Gatke External Dura-Blok Brake Lining, this latest Gatke development is being used on many applications to replace woven brake lining which is critically scarce due to war production requirements for prodigious quantities of woven asbestos materials. Rolls are furnished in a complete range of sizes up to 3/8-inch thick by 6-inches wide.

"EQUIPMENT that can't work under these conditions needn't apply!"


THIS IS NO PICNIC
WORKING AND LIVING CONDITIONS ON THIS JOB ARE AS DIFFICULT AS THOSE ENCOUNTERED ON ANY CONSTRUCTION JOB EVER DONE IN THE UNITED STATES OR FOREIGN TERRITORY. MEN HI
THIS JOB WILL BE REQUIRED
E UNDER THE MOST EXTRE
TIONS IMAGINABLE. TEMPERATU
ANGE FROM 90° ABOVE ZERO TO 70
RO. MEN WILL HAVE TO FIGHT S
IVERS. ICE AND COLD. MOSQUITOS,
AND GNATS WILL NOT ONLY BE ANN
BUT
CAUSE BODILY HARM.
IF YOU ARE NOT PREPARED TO WORK
UNDER THESE AND SIMILAR CONDITION
DO NOT APPLY
Bechtel-Price-Callahan

LOOK at that sign! • 800 miles of the world's worst wilderness—mud, snow, water, bitter cold, danger! Equipment that can't work under these conditions need not apply. • Whether it's man or machine, the conditions are the same, and dependability is absolutely paramount for success. Only the best survive the wilderness. • Northwests proved themselves long ago in the Canadian "Bush." • They have seen service from Alaska to Labrador on Canada's biggest rock jobs and they have met the cold and muskeg above the Arctic Circle. • The Canol Pipe Line is another one of the many rush jobs that proves the old Northwest axiom that better machinery means dependability, lower cost operation and greater output. Talk to the men who, in this emergency, are using all types of equipment. It's the machinery that is built to do a job—not built to a price—that is coming through.

ASK how the NORTHWESTS are doing!

-and when you have a real Rock Shovel you won't have to worry about output in dirt

NORTHWEST ENGINEERING CO., 1727 STEGER BLDG., 28 E. JACKSON BLVD., CHICAGO 4, ILLINOIS

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Field NOTES

Tons of Coal in Loose Piles

Conical Piles

When bituminous coal is piled in a conical pile the tonnage in the volume is easily estimated from the formula. $.00248D^3$ where D is the diameter of the pile in ft. at its base.

For anthracite coal the formula is $.00172D^3$.

Elongated Piles

But coal is often stored in elongated piles, in which case the tonnage of bituminous coal is computed from the formula:

$$.00248D^3 + .00474AD^2 = \text{tons bituminous.}$$

Where "A" is the length of the "crest" on top of the pile in feet. A good way in which to determine the length of this crest is to subtract "D", the maximum width in feet of the base of the elongated pile, from the total length of the pile at its base.

It is obvious that an elongated pile can be cut up into three parts. The two curved end portions when added together give us a pure and simple cone, whence we have the $.00248D^3$ in the formula. The central portion has a triangular section from end to end and its volume is one-half as great as would be the volume of a rectangular block having the same base and height. The tonnage in this central triangular portion is $.00474AD^2$. Adding the two together we therefore have $.00248D^3$ $.0047AD^2$.

Where the coal in the elongated pile is anthracite instead of bituminous the formula becomes:

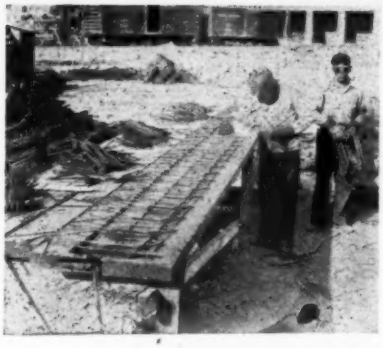
$$.00172D^3 + .0033AD^2 = \text{tons anthracite.}$$

"D" and "A" are both measured in feet in all of these formulas which are based on the fact that one ton of coal occupies approximately 38 cu. ft. on the average, whether anthracite or bituminous. The natural cone of anthracite is 0.25 as high as it is in diameter at its base. For bituminous coal the height factor is 0.36.

W. F. SCHAPHORST, M.E.

Joining Transverse Rods

In preparing reinforcements for the concrete sheet piling used at Imperial Dam, Charles M. Hill, sub-contractor, found arc welding the best method of joining the two parts of the 26 transverse rods used in each pile. The V-shaped section extending into the tongue of the pile had to be joined to the main transverse section by two tack welds. To speed up this work the parts for the 26 units were laid out together on a bench, with metal bars beneath them, one of which was connected to the ground cable. Two rows of metal pins projecting from the bench top held the parts in position until welded, after which they were gathered and tied in a bundle. Two men were able to make 200 units, or 400 welds per shift.



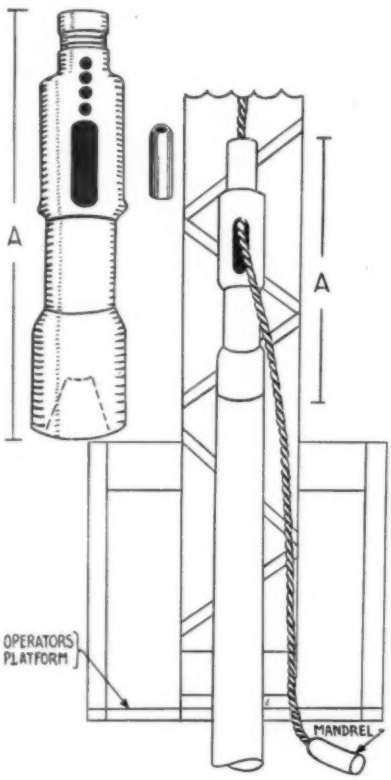
● Two rows of metal pins projecting from a bench top held parts in position until welded. Two men were able to make 200 units, or 400 welds per shift.

BLAST-HOLE Drilling

Open Side Swivel Socket

By G. R. WATSON

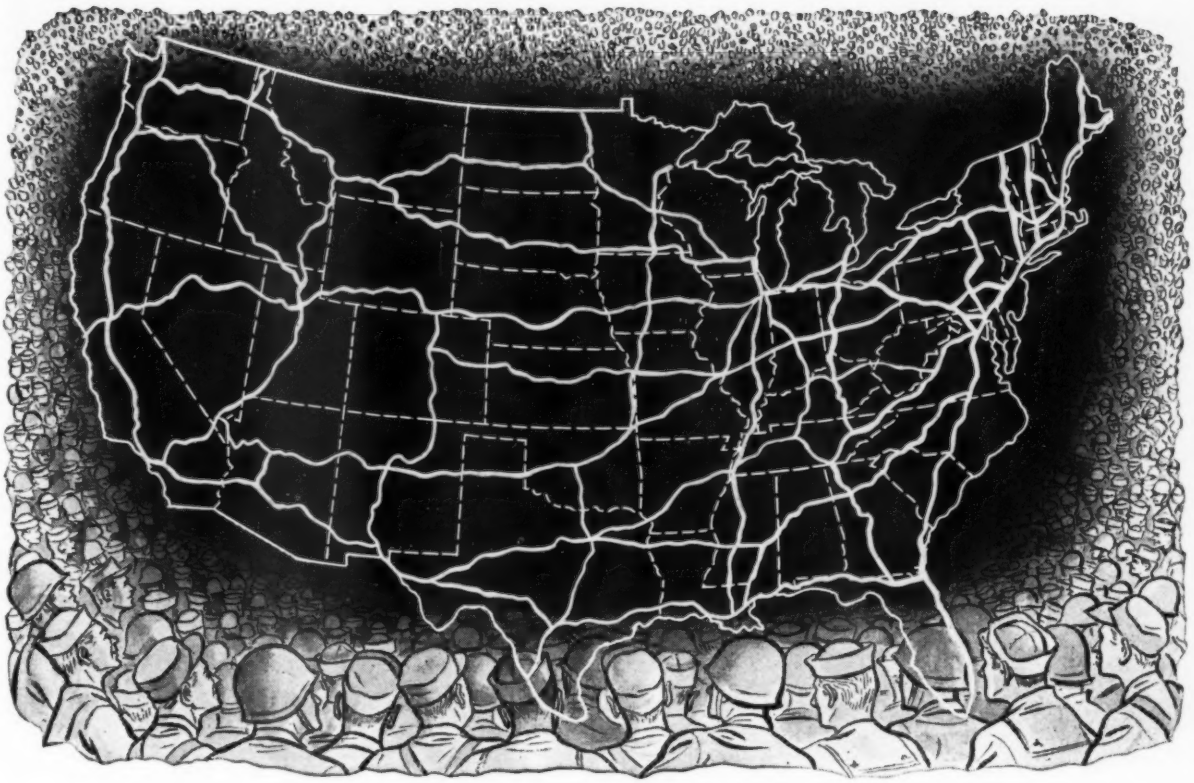
The open side swivel socket can save blast hole drillers up to 90 per cent of time wasted and all the hard labor required to reset cable which has pulled out of its socket on the heel sheave.



If the drill hole is shallow, say about ten feet deep, and the cable should break on the heel sheave, the slack end of this cable would run over the crown sheave and fall down around the base of the tools which are standing to from 15 to 20 feet above the ground level. It is impossible to break the joint and remove the rope socket while the tools are standing so high above the ground level. As a result, the usual procedure of re-connecting the cable with an ordinary swivel socket is as follows:

1. Reeve the cable over the crown sheave and fasten to broken cable near socket neck with cable clamps.
2. Pull tools clear above drill hole.
3. Move machine over deeper hole previously drilled.
4. Lower tools in hole where tool wrenches can be used to break joint and remove rope socket to permit resetting cable in mandrel.
5. When socket has been reset and wrenches used to tighten joints, the machine can be moved back over the unfinished hole and after considerable delay in leveling machine to line up tools with the hole, drilling can be resumed.

This unnecessary waste of productive time which usually amounts from three to five hours can be reduced to 30 minutes by the use of the "Open Side Swivel Socket" which has a side wall opening through which the mandrel can be withdrawn without break-



PLANNED POSTWAR HIGHWAY PROGRAM MEANS

Quick Employment For 3 Million

No one wants another depression 13,000,000 people deep. It will be much better to measure the height of national prosperity by the number of people employed.

Since it is generally agreed that gainful employment is the No. 1 factor in the national economy, it is to every American's best interest to get behind and push forward every sound postwar plan. ***One such is that of the American Road Builders' Association.***

It is sound because it will quickly and directly employ 3,000,000 people on a planned highway building program sorely needed before the war and absolutely necessary postwar.

It is sound because it eliminates attempts to fill depressions with improvised work relief amply demonstrated to be slow, costly, inefficient, and demoralizing.

It is sound because it is based upon plans and specifications carefully prepared in advance, cost estimates made in advance by public engineers, bids made by competing contractors who are willing to back up their judgment with their own funds, and the requirement of ample bond to further guarantee the delivery of quality work at contract costs and on time.

It is sound because it makes more efficient use of on-site employment and affords far more off-site employment in the production of materials and equipment. Thus, in addition to stimulating the consumer goods market, it induces far reaching employment throughout the production, transportation, and service industries. Studies made by the U. S. Public Roads Administration indicate that the proposed investment of 3 billion dollars annually in highways eventually results in business transactions totaling 9½ billion dollars.

Every American who wants to get early enjoyment of a better planned highway system, constructed better at the lowest bid cost, should write for and read the 64-page book entitled "A Sound Plan For Postwar Roads and Jobs." Among other things it points out that nearly enough in motor vehicle taxes is normally collected to pay for this sound, planned program if used for the purpose intended.

WRITE FOR THIS FREE BOOK!!!

E-44

Address

AMERICAN ROAD BUILDERS' ASSOCIATION, 1319 F Street, N.W., Washington 4, D.C.

OR

UNION WIRE ROPE CORPORATION, 2142 Manchester Ave., Kansas City 3, Missouri

AS YOU BACK THE ATTACK GUARD AGAINST A FUTURE SLACK

ing the joint or removing the socket from the top of the drill stem.

Regardless of where or when the cable fails, the "Open Side Swivel Socket" permits the mandrel to be removed without breaking tool joints and to reset the cable in the socket requires only a few minutes.

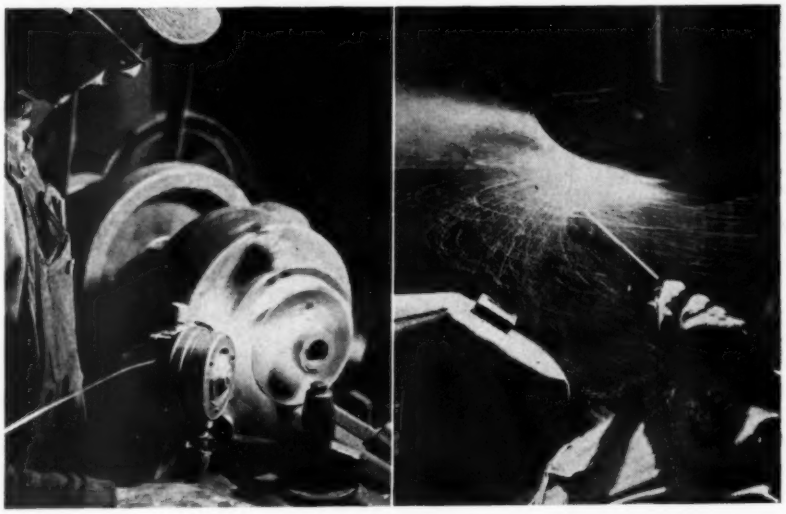
Easy removal of the mandrel permits frequent inspection of that portion of the cable which rotates in the neck of the socket and some fishing jobs are avoided by such inspection which reveals weakness in the cable before failure occurs.

The "Open Side Swivel Socket" costs little more than the regular swivel socket and its use will save many times the cost in a few months.

Reclaiming Worn Sheaves

By F. L. SPANGLER, M.E.

Since steel or iron sheaves are not easily obtained these days, it behooves everyone to make all sheaves or drums last as long as possible. Frequently old sheaves can be reclaimed and kept in use by building up the worn grooves. A common method for building up worn sheave grooves is to deposit metal in the worn grooves by either arc welding or by metal-spraying. Where the sheave groove is badly worn, flat spots or places of uneven wear can be built up by welding and then the welding arc, or the metal-spraying gun, used to apply the final layer over the entire wearing surface.



● **Left: Spraying molten metal onto the worn groove of a sheave mounted in a lathe. Above: Building up a worn sheave groove with the metallic welding arc.**

The use of too soft a material is often the cause of undue wear of sheaves. Originally soft sheave grooves built up with a hard metal have given as much as five times the original wear. A long-wearing sheave saves more steel than is at once apparent, for in addition to saving precious sheave metal, it is much easier on the rope than is a sheave of softer material.

However, wire rope in itself can be a needlessly destructive element to

(Continued on page 275)

WELLMAN WILLIAMS TYPE **BUCKETS**

Dig Deep and Bite Clean

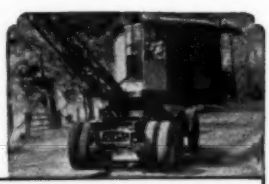
Wellman Buckets, in Power Arm and Multiple Rope Types develop great digging power. They bite into frozen ground, hard clay or shale, and come up with full loads.

WELDED ROLLED STEEL CONSTRUCTION FOR GREATER STRENGTH AND LONGER LIFE

Welded design which made Wellman Buckets so universally preferred for heavy duty in steel plants and dredging, is now featured in all Wellman-Williams Clamshell and Dragline Buckets — ⅜ to 16½ yd. capacities.

SEND FOR FREE BULLETIN

Tell us about your particular requirement and we will send full description of construction and features in special bulletins which clearly proves why YOUR NEXT BUCKET SHOULD BE A WELLMAN.



THE WELLMAN ENGINEERING COMPANY

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Sales and Service Agencies in principal cities

More Dependable POWER PER POUND WITH Sheppard Diesels

EVERY POUND . . . every inch . . . counts in the cargo holds of vessels bound for Alaska . . . Russia . . . Italy. That's one reason you find so many Sheppard Diesels "going over." They deliver more *dependable* power per pound . . . per inch. They combine compactness with the ruggedness demanded by tough overseas service.

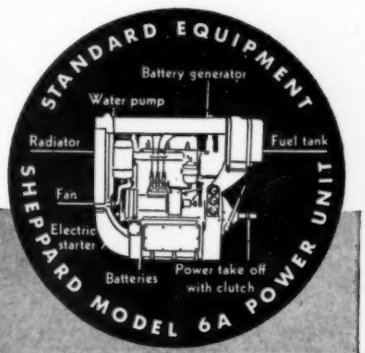
A Sheppard Diesel is a mighty big powerhouse for its size . . . whether it's used overseas or right here in America on railroads . . . in quarries . . . in mines . . . or in the oil and aviation industries. Sheppard designers and engineers pare away every surplus pound . . . every spare inch. You buy power stripped of bulk when you buy Sheppard.

Sheppard Diesels are delivered ready to run without makeshift additions. It's no trouble to put a Sheppard into operation . . . and it's no trouble to keep it in operation, either. The fuel injection system is simplified for maintenance-free performance.

It's not too soon to plan *your* future use of Sheppard Diesels.

At Sheppard, we work for the present . . . we think for the future. And we're learning constantly . . . learning to build the Diesel of tomorrow through experience gained today. Sheppard engineers are ready now to discuss your future use of Diesel power. A few Sheppard Diesel Engines are now available for essential industry on priority. Write for information and illustrated data sheet on the Sheppard Model 6A today.

R. H. SHEPPARD COMPANY, HANOVER, PA.



Sheppard

ALL AMERICAN DIESELS

NOT in the *Contract*

A woman missed her gloves as she was leaving the night club she had spent the evening with a male friend. Asking him to wait, she hurried back to look for them, searching first on the table and finally lifting the cloth to peer under the table.

A waiter hurried up to her.

"Pardon me, madam," he said, "but the gentleman is over there by the door."

Mother (entering the room unexpectedly): "Why, I never . . ."

Daughter: "Oh mother—you must have."

He: "Why wait until we get home before you tell me if you'll marry me or not?"

She: "I'm scared. This is the very spot where my father proposed to my mother."

He: "So what?"

She: "Well, on the way home the horses ran away and father was killed."

A guest at a political dinner went to the check room for his hat, but the attendant couldn't find it.

"It was a brand new hat," he told her.

"Well, you're out of luck," she replied. "All the new hats have been gone for half an hour."

A man was discovered by his wife one night standing over his baby's crib. Silently she watched him. As he stood looking down at the sleeping infant, she saw in his face a mixture of emotions — rapture, doubt, admiration, despair, ecstasy, incredulity. Touched and wondering alike at this unusual paternal attitude and the conflicting emotions the wife with eyes glistening arose and slipped her arms around him.

"A penny for your thoughts," she said, in a tremulous voice.

He blurted them out: "For the life of me, I can't see how anybody can make a crib like that for $3.49."

"Do you have a place in your organization for an experienced gold digger?"

An Irishman, inviting a friend to his wedding aniversary, explained how to find him in the apartment where he lived. "Come to the seventh floor," he said, "and where you see the letter 'D' on the door, push the button with your elbow, and when the door opens put your foot against it."

"Why do I have to use my elbow and my foot?" asked his friend.

"Well, for heaven's sake!" exclaimed the Irishman. "You're not coming empty-handed, are you?"

Once upon a time there was a farmer who had a garden full of the nicest cabbages you have ever seen. Each morning a little rabbit would hop in and eat one of the cabbages, and this went on until one day the farmer noticed his cabbages were all disappearing, and he couldn't figure what the hell was happening to them. But we know, don't we?

As the colonel stooped over to enter his car, his sergeant-chauffeur gave him a severe bump with his knee in the seat of his pants. Seeing the action of the sergeant, a private rushed over and gave him another hearty boot in the same sector. . . . At the court martial, the sergeant explained that his action was an involuntary reflex caused by pain he suffered when the colonel stepped on his pet corn. The private, when asked why he kicked the colonel, said "Well, I thought the war was over."

Visitor: "Don't you cut yourself pretty often with this straight-edge razor?"

Mountaineer: "Naw, I been shaving nigh on to five years now and I ain't cut myself neither time."

A general, returning to camp one evening, couldn't produce his identification. The rookie on guard duty, unimpressed, refused to let him pass through the gates. Finally, the exasperated general bent forward, pointed to the stars on his shoulders, and bellowed: "Do you know what these mean?"

"Sure," popped the rookie, "you got two sons in the service."

"Why did the foreman fire you?"

"Well, you know the foreman is the man who stands around and watches the others work."

"Yes, anyone knows that. But why did he fire you?"

"He got jealous of me. A lot of the fellows thought I was the foreman!"

Wife: "How did you like the WAC parade, dear?"

Colonel: "Marvelous. Five thousand women, and not a slip showing."

Field Notes

(Continued from page 272)

sheaves. Ropes which tend to twist, squirm, or rotate as they pass over sheaves cause far more rapid sheave-groove wear than where such twisting is absent. Because of the elimination of torsional stresses in preformed rope, this type of rope does not tend to twist or rotate in sheave grooves and thus reduces groove wear as well as rope wear.

ARC WELDING

How to Apply

1. Use an electrode that is suitable for depositing on the particular metal of which the sheave is made, and where practical, select an electrode that will give a hard surface without heat treatment. With a steel sheave use a manganese-steel electrode or a self-hardening electrode, deposited in a layer not more than ⅛ inch thick. Where the wear is greater, fill in with a carbon-steel electrode before depositing the final layer of hard metal.
2. Apply the metal by the skip weld method to minimize distortion.
3. Finally, true up the groove.

Advantages

1. Can be applied to sheaves having even or uneven wear.
2. Can be performed without removing the sheave, if necessary.
3. Many users of wire rope are equipped to build up sheaves by welding.
4. Deposit is very dense, contributing to long wear.

Disadvantages

1. Arc weld deposits on cast iron sheaves will require heat treatment if hardness is desired. This is not true of steel sheaves.
2. The heat of welding tends to distort the sheave.

METAL-SPRAYING

How to Apply

1. If uneven wear is present, build up to uniform contour by welding or by truing up on lathe.
2. Prepare surface by blasting with sharp steel grit. After blasting keep surface clean. Do not allow hands to come into contact with the surface.
3. Apply metal by rotating sheave in lathe with spray-gun attached to tool post. Use 1.2 carbon wire.

Advantages

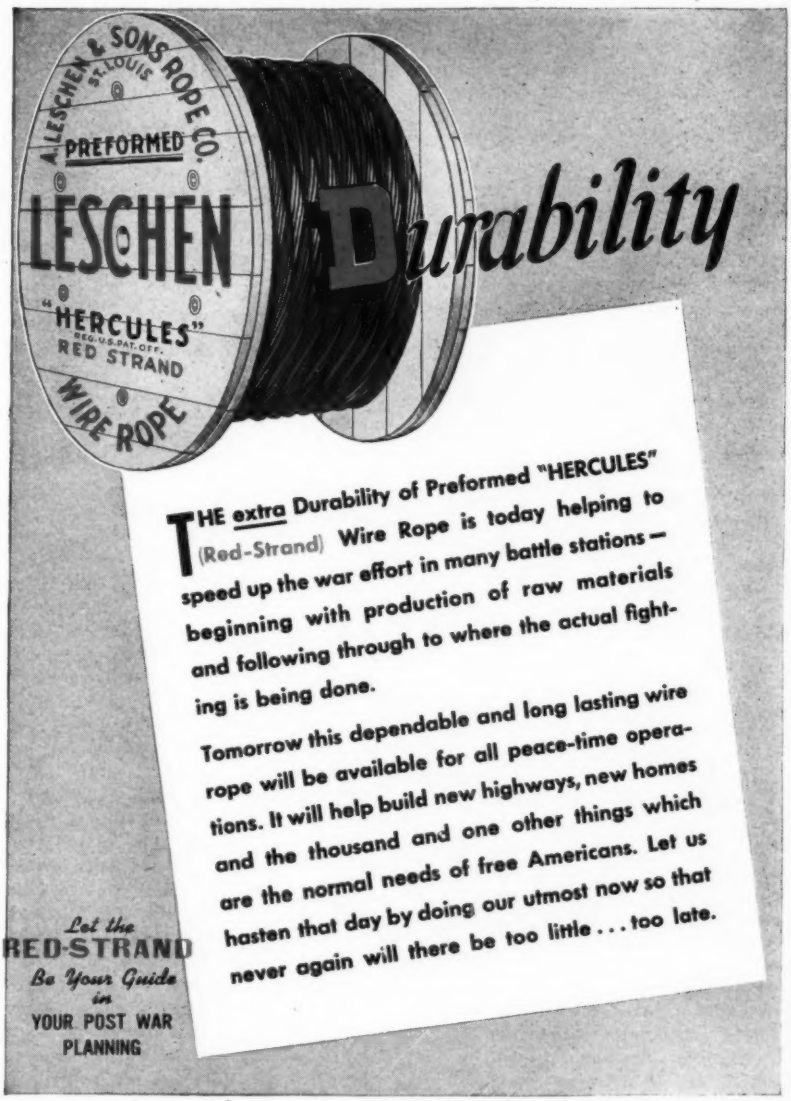
1. Can be used to give hard surface to cast iron sheaves as well as steel sheaves.
2. Does not distort sheave if applied as directed above.
3. Requires no truing up of sheave groove after application.
4. Deposited metal is capable of absorbing rope lubricant, thereby retaining oil film on surface.
5. Wearability of hard deposit increases life of sheave and rope.

Disadvantages

1. Very few users of wire rope have the equipment for metal-spraying and must rely on job metal-spray shops to do the work.
2. Since metal-spray is applied in a uniform layer, it is not suitable for building up worn spots or corrugations.

Blasting Ditch in Frozen Earth

Winter excavation of a large water line ditch in Denver, Colorado, when the earth was frozen deeply, was expedited by drilling holes in the ground three feet from each other, ahead of the shovel and blasting several holes at a time. A large wooden mat was used by the contractors, the Lock Joint Pipe Company, to muffle the shots. This mat was handled by cables to the boom of the shovel. The shovel was used for digging between blasts. **By JOSEPH C. COYLE**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Durability
THE extra Durability of Preformed "HERCULES" (Red-Strand) Wire Rope is today helping to speed up the war effort in many battle stations — beginning with production of raw materials and following through to where the actual fighting is being done.
Tomorrow this dependable and long lasting wire rope will be available for all peace-time operations. It will help build new highways, new homes and the thousand and one other things which are the normal needs of free Americans. Let us hasten that day by doing our utmost now so that never again will there be too little . . . too late.
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SEATTLE • • 3410 First Avenue South

Digging a Station

(Continued from page 237)

while digging was in progress on the other side.

Records in the railway company's office show 1,000,000 cu. yds., or 1,500,000 tons, of earth and rock were excavated and that roughly half of the excavated material was earth, mostly clay and the rest of it was rock—mostly Trenton limestone, but sometimes running into igneous rock that was quite hard.

Care in Blasting

Great care had to be taken in blasting rock because frequently it was quite close to the track on which trains were running in and out of the station. The train service through the tunnel was never interrupted for a day. It was not a very heavy service, the trains were never very long, and the service was electrified from some miles beyond the northern portal of the tunnel, but it required reasonable precautions to keep the service running while rock was being blasted.

The bank underneath the temporary tracks was sometimes shored with wooden supports and sometimes strengthened by piling rocks against it. The side walls of the excavation were held by building up a sloping bank of rock and clay with a revetment wall in some places.

A shelf of rock sloping downwards from Dorchester street, the first street south of the tunnel entrance, to St. Antoine street, two streets further south caused a special difficulty in the construction. Between these two streets, the rock shelf dropped 45 feet. A little north of St. Antoine street a shaft was dug 30 feet through the earth, to reach the surface of the rock, and then a 6' x 6' wooden caisson was lowered to the rock surface. Drillers and dynamiters were able to work in relative comfort and safety from this caisson.

The dynamite work consisted of two types: boulders and solid rock. A good many boulders were encountered near the surface. Some of these were shattered with a mudcap when the formation of the boulder offered a fold or a dent. A stick of dynamite and a fuse were packed into the dent with a cap of mud and clay, and the subsequent blast was sufficient to shatter the boulder. Where mudcapping was impossible, a one-inch hole was drilled with a jackhammer and the boulder was broken up with a single stick of dynamite.

A circular pattern of one-inch holes from two to four feet deep were drilled in the solid rock which was encountered below the surface and the shelf of rock referred to previously. The surrounding terrain and the nearness to the railway tracks determined the depth of the holes. All holes converged toward each other so that the circle was considerably smaller at the bottom of the holes than at the top. Usually a single stick of dynamite was packed into each, and the whole series blown at once. The explosive used was 40 per cent gelatin.

● **Approach over viaduct from the south to new Central Station.**

The problem of draining in an excavation is perhaps more serious in Montreal than in most places, because of the heavy snowfalls in winter which are liable to melt quickly and produce an unusually big rush of water when the temperature rises. (Snowfall in Montreal averages between 80 and 140 inches per winter.)

On Dorchester and Lagauchetiere streets, the first and second east-west streets south of the tunnel portal, there are five-foot sewers owned by the City of Montreal. On St. Antoine street, the first street really below the level of the terminal, the city has an eight-foot sewer. While excavation was in progress, temporary gullies were set in the lowest parts of the excavation, with temporary connections to the nearest city sewer, and the digging so arranged that water drained by gravity toward those gullies.

When the excavation for foundations was completed, a couple of north-south trenches were dug with a ¾-cu. yd. backhoe, and three-foot sewers laid therein and connected to the city's sewers at the St. Antoine street level. All subsequent draining from the station buildings was connected to these sewers. The drainage work was done by Duranceau and Duranceau.

The 300 six-foot reinforced concrete pillars used as a foundation for the station building and track structure were cut in the rock at the bottom of the excavation. Canadian National engineers decided it was best that these pillars be set in sockets cut into the rock, and also that there should be no shattering of the rock around the sockets. This precluded anything but the lightest blasting for these holes. Practically all of the work had to be done by "carving" with compression drills.

R. C. Vaughn, chairman and president of the Canadian National Railways, states that the company will make an early start on the building of the 16-mile line from Eastern junction to Bout-de-l'Ile on the Island of Montreal. Construction of this line was approved by Parliament, but work was deferred because of conditions.

WHEN YOU CHECK UP ON YOUR PLANT'S PAY-ROLL SAVINGS PLAN FIGURES!

These days, things change with astonishing speed. The Pay-Roll Savings Plan set-up that appeared to be an outstanding job a short time ago, may be less than satisfactory today.

How about checking up on the situation in *your* plant? Checking up to see if everybody is playing his, or her, part to the full measure of his, or her, ability. Checking up to see if 'multiple-salary-families' are setting correspondingly multiple-savings records.

A number of other groups may need attention. For example, workers who have come in since your plant's last concerted bond effort. Or, those who have been advanced in position and pay, but who may not have advanced their bond buying accordingly. Or even those few who have never taken part in the plan at all. A little planned selling may step contributions up materially.

But your job isn't finished, even when you've jacked participation in your Pay-Roll Savings Plan up to the very top. You've still got a job before you—and a big one! It's the task of educating your workers to the necessity of not only buying bonds, but of *holding* them. Of teaching your people that a bond sold before full maturity is a bond robbed of its chance to return its full value to its owner—or to his country!

So won't you start *checking* . . . and *teaching* . . . today?

War Bonds To Have And To Hold!

LET'S ALL BACK THE ATTACK WITH WAR BONDS!

The Treasury Department acknowledges with appreciation the publication of this message by

Excavating Engineer

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council

New trade literature

Title: **"Contractors' Handbook and Legislative Directory"**
Subject: Leather-bound 150-page loose-leaf booklet with complete legislative road builders directory, U. S. War organization offices and Manpower agencies in Chicago, District Highway officials of state, and directory of representatives of the Road Building Industry of Illinois with their company affiliations. The book also contains a buyer's guide and an advertisers' index.
Where to Get: Illinois Road Builders Association, Chicago 1, Ill. ($5.00)

Title: **"War Emergency Service Book No. 4"**
Subject: Describes General Preference Order M-84, what the new order provides, an analysis of the order, the difference between "permitted use" and patriotic use and a chart-explanation of cordage end use.
Where to Get: Plymouth Cordage Company, North Plymouth, Mass. (Free)

Title: **"Eagle Iron Works New Catalog"**
Subject: Sand, gravel and ore washing and classifying equipment designed and manufactured by the Eagle Iron Works is described and illustrated in a 24-page catalog-bulletin.
Manufacture, operation, various special features and a detailed discussion of operating mechanism of the Eagle washer are given. Eagle single and double screw fine material washers are pictured and detailed shale remover and auxiliary shale remover installations are described.
Where to Get: Eagle Iron Works, Des Moines, Iowa. (Free)

Title: **"Hydraulic Torque Converters"**
Subject: Facts concerning the function, operation and installation of Hydraulic Torque Converters are concisely presented in this 16-page booklet. Several models are described in detail with the aid of photographs and drawings. Sufficient installation data are included for drawing up preliminary specifications for equipment on which torque converters are to be used.
Where to Get: Twin Disc Clutch Company, Hydraulic Division, Rockford, Ill. (Free) (Request Bulletin No. 135)

Title: **"The Davey Power Take-Off"**
Subject: New, illustrated folder showing how the Davey Power Take-off enables truck engines to power such auxiliary equipment as pumps, generators, air compressors, concrete mixers, welders, etc. The development of the power take-off, construction of the unit, its advantages in modern industrial use are concisely outlined. Specifications of the three standard models are included.
Where to Get: Power Take-off Division, Davey Compressor Company, Kent, Ohio. (Free) (Request Bulletin E-166).

Title: **"How to Prevent Truck Tire Failures"**
Subject: The booklet has been especially designed for the truck owner or operator to acquaint him with the most common causes of truck tire failure and point out how these can be prevented by paying attention to some simple rules.
Were to Get: The B. F. Goodrich Company, Akron, Ohio. (Free)

Title: **"American Standards"**
Subject: A new catalog by the American Standards Associations listing 600 standards, 64 being approved or revised since April, 1943. Covered are specifications for materials, methods of tests, dimensions, definitions of technical terms, procedure, etc. Price list for individual standards is given.
Where to Get: American Standards Association, 29 West 39th Street, New York 18, N. Y. (Free)

Title: **"50-Ton Diesel-Electric Locomotive"**
Subject: A 16-page booklet giving specifications such as construction features, weight, speed and other data. Facts of interest to maintenance men, brakemen and engineers are included.
Where to Get: General Electric Company, Schenectady, N. Y. (Free)

Title: **"Why Construction Men Favor Manganese Steel"**
Subject: A 32-page illustrated bulletin providing information on how to reduce costs in the construction industry; how equipment parts made of manganese steel stand up under contact with rock, ore and other destructive forces; the research that has made manganese steel uniformly durable.
Where to Get: American Manganese Steel Division of the American Brake Shoe Co., Chicago Heights, Illinois. (Free)

Title: **"Lumber Industry Facts"**
Subject: Presented in this book are facts on: raw material, the forest, lumber and timber products, lumber productions, lumber shipments, lumber consumption, pulpwood, pulp and paper. A chapter on the forestry situation, reviews, pertinent legislation; another chapter outlines the objectives, activities, officers, and membership.
Where to Get: National Lumber Manufacturers Association, 1319 18th Street, N.W., Washington, D. C. (Free)

Notes from the manufacturers

R. G. LeTourneau, Inc. of Peoria, Ill., which recently announced plans to establish its own exclusive distributor organization, has named seven dealers in as many portions of the United States and Canada. Included among those named are: Loggers and Contractors Machinery Co., Portland, Oregon; The Victor L. Phillips Co., Kansas City, Missouri; The Nicoll - Talcott Corporation, Hartford, Connecticut; Wylie-Stewart Machinery Co., Oklahoma City, Oklahoma; General Supply and Equipment Co., Inc., Baltimore, Maryland; Tri-State Equipment Co., Memphis, Tennessee, and General Supply Co. of Canada, Ltd., Ottawa.

Harnischfeger Corporation, Milwaukee, Wis., announces that J. D. Glatz, formerly with the WPB, has been appointed P&H's new repair sales division manager.

La-Plant Choate Manufacturing Co., Inc., Cedar Rapids, Iowa, announces the opening of a sales office in the International Building, Rockefeller Center, New York City. The new office is in charge of Jay Fetters, formerly London manager of Cater-

(Continued on page 280)

ERIE THE COMPLETE LINE BUCKETS

Erie builds *all* types of buckets in various weights and capacities to meet the job and operating conditions. Choose the correct bucket for the job and you get the maximum speed and output. Write for broadside on the complete Erie line of buckets

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TO ADVERTISE: All advertising in this section is payable in advance. Rate: 60c per line, or $7.20 per inch of 12 lines. Minimum charge $2.40. No discounts; no commissions. If no change in copy is desired, three continuous insertions are offered for the price of two. Read these instructions carefully. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Count your own copy to save delay. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January issue closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

1-YD. STEAM SHOVEL
Bucyrus-Erie 31-B steam shovel, 1 yd. dipper, 21'9" boom and 15' handle. Fair condition. Located Kansas City. Box 3029

FOR SALE
¾ yd. P&H Dragline, 40' boom, excellent working condition. Located at Waynesville, Ill. Adam H. Wilson, R. 1, Waynesville, Ill.

FOR SALE
1 Northwest, 1¼ cu. yds. gasoline model No. 5 shovel and dragline.
1 Northwest, 1 cu. yd. gasoline model No. 105 shovel.
1 Osgood, 1 cu. yd. gasoline model J.M.S. shovel.
Write for particulars
Box 188, Equity, 113 West 42nd, N. Y.

FOR SALE
Erie Steam Shovel type B. Boiler newly retubed, ⅞ cu. yard bucket, dipper stick and boom very little used. 82' crane boom.
Badger-Rand Ice Company
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FOR SALE OR RENT
½ yd. Bucyrus Crane—Clamshell—Dragline
1 yd. Northwest Crane—Clamshell—Dragline
1½ yd. Marion Shovel—Diesel
2½ yd. Bucyrus Dragline—Diesel
1,000,000 Ton Strip Coal Mine in Illinois.
A. W. Nevers, Mt. Pleasant, Ia., Phone 32

FOR SALE
2 BUCYRUS-ERIE ¾ CU. YD.
MODEL B
STEAM SHOVELS
In fair condition, at sacrifice prices. Location—Pennsylvania, and New Jersey.
Box 973 Equity 113 West 42nd St.
New York City

FOR SALE
1—10-B Shovel Front, Boom, Dipper Stick and Bucket, no cables, no lagging—in excellent condition, single rope crowd type. Suitable for machines 14760 and earlier. Priced reasonably. Atlanta. Box 3032

Diesel 50 bulldozer.
Shovel attachment only for P&H Model 204. Box 3021

FOR SALE
1 37-B shovel front as taken from 37-B No. 25018
1 20-B shovel front as taken from 22-B No. 20202.
These are in first-class condition and complete—offered for immediate shipment subject to prior sale. Box 3036

FOR SALE
Walking Dragline, 60' boom, 1½ yd. bucket. Good condition; extra parts available. Eastern location. Box 3026

DREDGES

FOR SALE
Self propelling steam ladder bucket dredge 223 ft. hull, 9 ft. draft, 50 ft. dredging depth, one yard buckets, location near Montreal. Box 3030

FOR SALE
12" Hydraulic Dredge with 10" discharge, 350 HP Superior Diesel and auxiliary motor, steel hull, house boat, and fuel barge. Location East Coast. Box 3027

10-B Erie Skeleton Trailer. Serial No. 150. Very good condition. Price $500. Box 3017

50-B BUCYRUS-ERIE SHOVEL PARTS
Steel boom, set dipper sticks, 40 H.P. crowd motor, 40 H.P. swing motor, 100 H.P. hoist motor. Located Northern Ohio District. Motors are for 440 volt, 3 phase, 60 cycle current. Box 3018

FOR SALE
Caterpillar diesel No. 11 Motor Patrol; Schramm water cooled air compressor—size 5¾x6x4; Tournapull wheels; Baker & Isaacson road rippers; Caterpillar diesel pump and block No. 2H 3513 W; Page automatic 2½ and 1 yd. dragline buckets, also asst. of tracks, rollers, gears and housings for A.C. Int. and Caterpillars. Inquire what parts you need. Sam, P.O. Box 182, East Point, Ga.

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Winslow Coal Corp., Petersburg, Ind.

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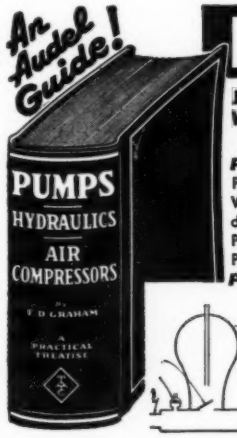
3—¾ cu. yd. Type AY Heavy Duty Dragline Buckets.
2—¾ cu. yd. Type AU Light Weight Dragline Buckets
1—¾ cu. yd. Type AX Med. Duty Dragline Bucket
2—1 cu. yd. Type AU Light Weight Dragline Buckets
5—1¼ cu. yd. Type AY Heavy Duty Dragline Buckets
1—1¼ cu. yd. Type AX Med. Duty Dragline Bucket
2—1½ cu. yd. Type AU Light Weight Dragline Buckets
1—1¾ cu. yd. Type AY Heavy Duty Dragline Bucket
3—1¾ cu. yd. Type AU Light Weight Dragline Buckets
1—2 cu. yd. Type AU Light Weight Dragline Bucket
1—2¼ cu. yd. Type AU Light Weight Dragline Bucket
1—2½ cu. yd. Type AU Light Weight Dragline Bucket
1—3 cu. yd. Type AU Light Weight Dragline Bucket
1—4 cu. yd. Type Y Special Heavy Duty Dragline Bucket
1—7 cu. yd. Type W Light Weight Dragline Bucket.
BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee Wisconsin



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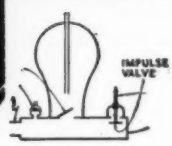

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International Harvester Model U-10 4 cylinder 4¼" x 5" Gasoline Engine, 40 H.P. @ 1150 RPM Full Load Speed. Engine Rotation Counter-clockwise from flywheel end. Engine includes standard power take off clutch, hand crank and fuel tank assemblies, and oil filter, hood and side sheets, standard fan and radiator assemblies, name plate, special governor control assembled on center of rear panel.

FOB South Milwaukee, Wis.

BUCYRUS-ERIE COMPANY
Parts Department

FOR SALE

No. 7 Ross Chain Feeder complete with extra heavy chains, 7½ H.P. 440 volt motor and complete drive. Located near Hibbing, Minn.
Box 3035

FOR SALE

Caterpillar RD6 Diesel with ⅝ yd. shovel; D-8800 Power Unit; TD-40 hydraulic bulldozer; portable air compressor and drills; Buckeye tile ditching machine; 1 yd. Northwest Shovel, Crane, Clam, Dragline. A. W. Nevers, 112 N. Main St., Mt. Pleasant, Ia. Ph. 32

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1—¾ cu. yd. Skimmer Scoop Dipper—20-B
1—¾ cu. yd. Welded Dipper—21-B
1—1 cu. yd. Drag Shovel Dipper—29-B
1—1¼ cu. yd. Drag Shovel Dipper—33-B
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2—1½ cu. yd. Snow Loading Dipper—10-B
1—2 cu. yd. Rock Dipper—75-B
1—2¼ cu. yd. Inserted Type Dipper—50-B
1—2¼ cu. yd. Vanderhoef Type Dipper—52-B
1—2¼ cu. yd. Inserted Type—55-B
1—2¼ cu. yd. Welded Dipper—48-B
1—2¼ cu. yd. Rock Dipper—75-B
2—2½ cu. yd. All Cast Dipper—55-B
1—2¾ cu. yd. Light Duty Shovel Dipper—54-B
1—3½ cu. yd. Coal Loading Dipper—75-B
1—4 cu. yd. Type IV Med. Duty Dipper—100-B
1—8 cu. yd. Stripping Dipper—320-B

F.O.B. Works

Write for any further information desired.

BUCYRUS-ERIE COMPANY
Parts Department
South Milwaukee **Wisconsin**

FOR SALE

3 Athey 16-yd. Crawler 2-way Dump Trailers
2 Athey 10-yd. Crawler 2-way Dump Trailers
all complete with hydraulic pumps.
Wm. H. Ziegler Co., Inc.
Minneapolis-St. Paul-Duluth-Crookston

Class 14 Steam Dragline, 70' boom, good condition, eastern location. Box 3020

FOR SALE

3T Monighan Dragline No. 407 modernized to compare with 3W, 70' boom, 10' extension, 3½ yd. dragline bucket. Fairbanks Morse diesel engine, Ward Leonard electric swing. Available now. Located state of Washington. Box 3034

Caterpillar Steam Crane, equipped with dragline and 50 ft. boom which will handle a 3 yd. bucket. This machine in good repair, can be seen in our yard. Weighs 45 ton.
Box 3016

WANTED

Used or new 1½-2 ton Gasoline Tandem Roller. Box 3037

WANTED

Need 4-6 Yard Dragline with 150 ft. boom or other machine capable of stripping 65 feet of dirt. Prefer to rent over a period of three to five years. Write or wire Box 3028

WANTED

Late model 3-W Bucyrus-Monighan dragline with Ward-Leonard control. Will pay cash. Box 3033

WANTED

2 or 2½ or 3 yard stripping shovel, Diesel or Electric, long reach, must be first class condition, preferably located Ohio or vicinity. D-7 Caterpillar Tractor with bulldozer or angledozer. First class condition or rebuilt and guaranteed.

Eastern Clay Products, Inc., Eifort, Ohio

WANTED

10-B shovel preferably with crane attachment. J. C. Campbell Co., 413 W. Michigan St., Duluth, Minn.

WANTED

85- to 100-B Bucyrus Electric Shovel; 1½ to 2 yd. Marion Electric Shovel; Marion 40-A Dragline. A. W. Nevers, 112 North Main St., Mt. Pleasant, Ia. Phone: 32.

WANTED

2½ YARD DRAGLINE
Prefer Late Model Marion,
Bucyrus-Erie or P&H

DAKOTA COLLIERIES COMPANY
1506 Foshay Tower, Mpls. 2, Minn.

WANTED

Shovels, Cranes, Draglines, Bulldozers and Tractors with High-Lifts. State your best price when replying. Box 3015

POSITIONS WANTED

Address all box numbers
c/o EXCAVATING ENGINEER
South Milwaukee, Wis.

HELP WANTED

Sand Plant Supt. Good permanent position. Write complete qualifications, experience and place of birth, giving all dates, salary expected. Box 9225

ALL-AROUND OPERATOR

Can operate any kind of shovel, dragline, crane or clamshell—steam, diesel, gas or electric. Can do own repair work. Experienced in quarry, ore and coal stripping. Prefer quarry or coal stripping. Familiar with grading work. Will go anywhere. Box 9226

Notes from the Manufacturer

(Continued from page 278)

pillar Tractor Company, and more recently on the staff of the U. S. Army Engineers.

Tyson Bearing Corporation, Massillon, Ohio, announces that John K. Colgate, vice-president and treasurer of the company for the past three years, was elected president.

The Timken Roller Bearing Company of Canton 6, Ohio, manufacturers of Graphitic and Alloy steels, announce The Peninsular Steel Co. of Cleveland, Ohio, will expand their activity in Ohio for the distribution of Graphitic Tool Steels. The added territory will include Dayton and Cincinnati, formerly covered by Quality Steels, Inc., of Dayton and Frederick Steel Co. of Cincinnati.

American Car and Foundry Company, New York City, announces the following appointments and designations of duties: Victor R. Willoughby, vice-president, formerly in charge of engineering, has been assigned as Director of Research and Development; Edmund D. Campbell, formerly general mechanical engineer, is now vice-president in charge of engineering, and Alvin A. Borgading, formerly general purchasing agent, has been appointed vice-president in charge of purchases.

Diesel Engine Manufacturers Association, through Harvey T. Hill, recently appointed executive director, announces that headquarters of the association will be One LaSalle St., Chicago, Ill.

The Kwik-Mix Concrete Mixer Company, Port Washington, Wisconsin, a subsidiary of the Koehring Company, Milwaukee, that has manufactured the Koehring Dandie Mixers for eight years, will now assume the sale, service, engineering and development of the 7-S, 10-S and 14-S Dandie Mixers. Service will be directed from the Kwik-Mix Concrete Mixer Company. Inquiries for information are to be addressed to Kwik-Mix at Port Washington.

Barber-Greene Co., Aurora, Ill., announces that D. G. McIlwraith has retired after 27 years of service with the company, practically all of that time as secretary. John M. Spence has been elected to the board of directors and to the office of secretary. Mr. Spence joined Barber-Greene in 1918 and for the past 25 years has been chief auditor.

Allis - Chalmers Manufacturing Co., Milwaukee, Wis., announces the election by the board of directors of three new vice-presidents. They are W. A. Roberts, William C. Johnson and James M. White.

Mr. Roberts will retain his title of manager of the Tractor Division, Johnson will continue in charge of sales of all products excepting those of the Tractor Division, and White will continue to direct the company's manufacturing activities of all plants.

Buckeye Traction Ditcher Company, Findlay, Ohio, announces that A. M. Guthrie has been advanced from Eastern District Manager to Field Service Manager. He is assuming the entire handling of distributor policies and appointments through the company's district managers. His headquarters will be at the plant at Findlay.

AMERICAN CABLE

FOR EVERY JOB...

TRU-LAY Preformed saves time. Yes, this rope saves time—the most vital commodity in industry, the most important factor in winning the war.

TRU-LAY saves time by reducing the number of shut-downs for replacement. That's because it lasts longer.

It also saves replacement time because it's more flexible and easier to handle. You don't have to seize the ends of **TRU-LAY** Preformed.

It saves time because it's safer. Broken crown wires in **TRU-LAY** lie flat. They don't wicker out to jab hands and cause infection.

All these and many other advantages of **TRU-LAY** come from its being perfectly preformed.

AMERICAN CABLE DIVISION
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT, CONNECTICUT

ESSENTIAL PRODUCTS... TRU-LAY Aircraft, Automotive, and Industrial Controls, TRU-LOC Aircraft Terminals, AMERICAN CABLE Wire Rope, TRU-STOP Brakes, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Castings, CAMPBELL Cutting Machines, FORD Hoists, Trolleys, HAZARD Wire Rope, MANLEY Auto Service Equipment, MARYLAND Bolts and Nuts, OWEN Springs, PAGE Fence, Stapled Wire, Welding Wire, READING-PRATT & CADY Valves, READING Steel Castings, WRIGHT Hoists, Cranes... *In Business for Your Safety*

The BIGGEST JOBS are Yet to Come!

ALL indications point to an after-peace construction program that will top anything this country has ever seen. Even huge war time construction projects will probably be dwarfed if plans now on drafting tables or already completed are carried out. New roads and highways . . . levees and dams for irrigation, flood control and power . . . civilian airports . . . repair and improvement of existing roads . . . these are just a few types of necessary public works that must be started as soon as conditions permit.

But you will have to be ready for these big jobs if you hope to be the successful bidder. Tax dollars must produce more under private contract in peace time, and competition for contracts will be keen. Bids will naturally go to contractors with organizations and equipment to handle the work most efficiently.

This is a good time to study your hauling equipment requirements, present and future. Dependable performance on hundreds of the toughest jobs has proved that Euclid capacity, efficiency and long life result in lowest cost per ton or yard hauled. Euclid distributors and field representatives are at your service to help with plans for your hauling equipment needs.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLID SELF-POWERED HAULING EQUIPMENT
For EARTH . . ROCK . . COAL . . ORE

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